R-030-208.1

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REMOVAL ACTION NUMBER 26 - "ASBESTOS ABATEMENT REMOVAL ACTION"

08-10-1992

DOE/EPA
DOE-2351-91
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LETTER

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Department of Energy
Fernald Environmental Management Project
P.O. Box 398705
Cincinnati, Ohio 45239-8705
(513) 738-6357

AUG 10 1992
DOE-2351-92

Mr. James A. Saric, Remedial Project Director
United States Environmental Protection Agency
Region V - MS 5HR-12
230 S. Dearborn Street
Chicago, Illinois 60604

Graham E. Mitchell, DOE Coordinator
Ohio Environmental Protection Agency
40 S. Main Street
Dayton, Ohio 45402

Dear Mr. Saric and Mr. Mitchell:

REMOVAL ACTION NUMBER 26 - "ASBESTOS ABATEMENT REMOVAL ACTION"

References: 1) Letter, Graham E. Mitchell to J. R. Craig, "Asbestos Abatement Removal Action," dated July 1, 1992

2) Letter, James A. Saric to Jack R. Craig, "Disapproval of Removal Action 26 - Compilation of Existing Documentation Supporting Asbestos Abatement," dated July 6, 1992

Enclosed you will find the following information which addresses the United States Environmental Protection Agency (U.S. EPA) and Ohio Environmental Protection Agency (OEPA) comments cited in the referenced letters on the Removal Action Number 26 - "Asbestos Abatement Removal Action:"

1) Attachment I, Part A - Detailed description of how each of the U.S. EPA general comments have been resolved.

   Attachment I, Part B - Detailed description of how each of the OEPA general and specific comments have been resolved.

2) Attachment II - Revised portion (Section I) of the Asbestos Program Compendium reflecting the actual revisions made to the Removal Action Number 26 Compendium. This replaces Section I in the original Removal Action Number 26 submittal that you received May 19, 1992.

3) Attachment III - A draft Removal Site Evaluation that details the information needed and the rationale for designating the Asbestos Program as a Removal Action.

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4) Attachment IV - Other additional information that has become available ("FEMP Asbestos Abatement Plans") since the original Removal Action Number 26 transmittal on May 19, 1992.

As revisions to other General Supporting Documentation (Section II) and Implementing Procedures (Section III) are made, revised copies will be forwarded to your office in the annual scheduled update to the Removal Action Number 26 Compendium (June 30, 1993).

If you or your staff have any questions, please contact me at FTS 774-6159 or (513) 738-6159.

Sincerely,

Jack R. Craig
Fernald Remedial Action
Project Manager

FN:RJ Janke

Enclosures: As Stated

cc w/encs.:

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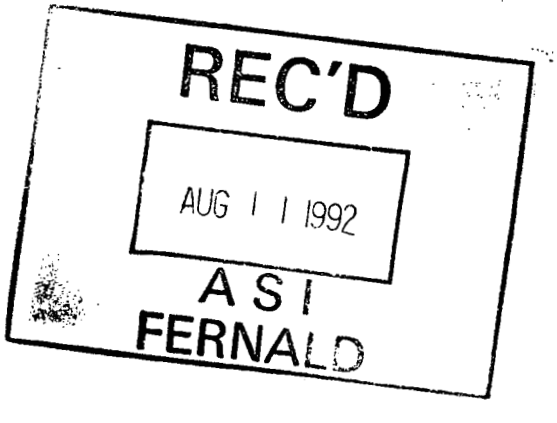

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ATTACHMENT I, PART A

Detailed resolution of USEPA comments

Attachment I

The following statements represent the FEMP's recommended resolution of USEPA Region V comments on the "Removal Action 26 Compilation of Existing Documentation Supporting Asbestos Abatement."

USEPA General Comment No. 1

The document does not meet the content criteria for a RA as defined in the NCP, Section 300.415. The document, at a minimum, should consider the following: (1) actual or potential exposure to nearby populations, animals, or the food chain from hazardous substances, pollutants, or contaminants; (2) actual or potential contamination of drinking water supplies or sensitive ecosystems; (3) hazardous substances...that may pose a threat of release, (4) high levels of hazardous substances or pollutants in soils largely at or near the surface, especially those substances that may migrate to subsurface soils or ground water; (5) weather conditions that may cause hazardous substances, pollutants, or contaminants to migrate or be released; (6) threat of fire or explosion; (7) the availability of other appropriate federal or state authorities to respond to the release; and (8) other situations or factors that may pose threats to public health, welfare, or the environment.

The objective, scope, and framework of the RA should be consistent with the NCP, considering the decision-making criteria mentioned above. Also, the decision-making process should be based on a removal site evaluation (RSE), which was not included with the document. DOE should clearly describe the RA objectives and include the RSE.

Response to Comment No. 1

The additional removal actions proposed by DOE in the January 15, 1992 submittal established the ongoing Asbestos abatement program as a Removal Action (RA) under CERCLA. The designation of the Asbestos Abatement program as a RA was established based on extensive knowledge of asbestos concerns at the FEMP.

In order to better coordinate the ongoing activities with the CERCLA program, DOE proposed, in the January 15, Phase III transmittal, to submit a compilation of procedures and documentation supporting the Asbestos program to EPA by May 19, 1992. The compilation of procedures was chosen by DOE in order to allow the program to continue, and at the same time consolidate the various components of the program into one cohesive group.

The objective, scope and framework for the RA was developed consistent with CERCLA and was based on an extensive survey of Asbestos Containing Materials (ACM) at the FEMP. This Site Survey, entitled the "Asbestos Survey and Assessment for the FEMP", provided an in depth analysis and assessment for the asbestos containing material at the site.

This report provides extensive information on the nature of asbestos at the FEMP as well as a characterization of the release potential and recommended response actions for the ACM. This document, although large, is available upon request. The intention behind the supporting documentation was to provide an overview of the scope and objectives for this RA.

In order to fully respond to the USEPA comment, DOE has revised the supporting documentation and developed an RSE based on the Site Survey. This is included in this re-submittal.

USEPA General Comment No. 2

The document does not include a discussion of the nature and extent of the contamination or any approach to defining the extent of contamination. This particularly applies to potentially radioactive asbestos containing material.

Response to Comment No. 2

The Removal Site Evaluation includes a discussion on the nature and extent of the asbestos contamination on site. The Site Survey identified six principle areas of ACM concern. These six areas are discussed in the RSE and this discussion is in the revised supporting documentation as well.

The nature and extent of Asbestos Contamination was not fully known until just prior to the submittal of the procedure documentation. Otherwise, this information would have been included.

USEPA General Comment No. 3

All reference to the document as a RA work plan should be removed from the document, unless the document is revised to include the required content of a RA work plan.

Response to Comment No. 3

All references to the document as a RA work plan have been removed, consistent with the logic described in the response to Comment No. 1.

ATTACHMENT I, PART B

Detailed resolution of OEPA comments

Attachment I

DOE RESPONSE TO OHIO EPA COMMENTS
ASBESTOS ABATEMENT REMOVAL ACTION #26

General Comments

OEPA General Comment No. 1:

"In addition to the work practices for 'large-scale' asbestos abatement projects, as described in Step 2, area specific removal plans will need to be reviewed by OEPA prior to implementation."

DOE Response:

Although the regulatory classification of small scale or large scale asbestos abatement projects is ambiguous, DOE proposes for the purposes of this RA to classify large scale ACM projects as those that address quantities greater than the Reportable Quantity values detailed in NESHAP Subpart M. Furthermore, DOE proposes to provide the asbestos removal plans that are included in the Notices of Intent (NOIs), as Procedure addenda to this Removal Action, in order to address large scale projects. These removal plans will be provided to the EPA at a minimum of 10 days prior to the initiation of any field activities, because NESHAP Subpart M requires DOE to notify the EPA at least 10 days prior to the initiation of large scale activities.

OEPA General Comment No. 2:

"The policies governing abatement of asbestos containing material (ACM) which has become radioactively contaminated is insufficient. The document details radiation and asbestos control policies, however, the policies are not integrated for large scale projects of this nature."

DOE Response:

Asbestos has always been treated as being potentially radioactive, due to the possibility of sub-surface contamination. The precautions used for asbestos are therefore equal to, or greater than, the precautions necessary for radiological control.

Asbestos Abatement Model Specifications are now being developed, which will address the specific issue of integrating asbestos and radioactive concerns. A copy of these Specifications will be

included in the next revision to the Compilation, due June 30, 1993.

Specific Comments

OEPA Specific Comment No. 1:

"Asbestos Control Policy (ACP) - Section 1, Figure 1

The ACP will be managed asbestos abatement through two (2) policies; long term, over 5 years, and short term, under five (5) years. The content of the long term plan is unclear as to what it will address. Information to be contained in the plan needs clarified."

DOE Response:

On June 30, 1992, FEMP ASBESTOS ABATEMENT PLANS closed out FY1992 ADS Milestone ADSM:92:0102, "Long Range Plans for Containment & Removal of Asbestos". These Plans are submitted as Attachment A, and are to be placed in Section III, Step 8 of the Compilation that was previously submitted.

OEPA Specific Comment No. 2:

"Respiratory Protection - Section 2, Subsection 8, Pg. 8-1

The Respiratory Protection Policy calls for placing used defective, or outdated respirators into a recycling receptacle. If abatement workers' respirators are to be deposited into recycling bins upon completion of each day's work, will this interfere with proper respirator fit?"

DOE Response:

Upon completion of each day's work, the workers place their used respirators in sealable plastic bags. They seal these bags and then place them in the recycling bins.

Site Services Procedure SOP 46-C-301, "Cleaning, Inspecting, and Reconditioning Respirators" outlines the procedures that are used to, among other things, insure that respirators are not deformed. In the three years of using this recycling process, there have been no noticeable problems caused by depositing the used respirators in recycling bins.

A copy of SOP 46-C-301 will be forwarded on request.

OEPA Specific Comment No. 3:

"Radiation Control Sec. II, ss 3.2.4, pg. 3

The personnel exposure record data sheet referenced to illustrate information disclosed is missing from document."

DOE Response:

The "personnel exposure record data sheet" was inadvertently omitted. The FMPC Radiation Control Manual dated December 31, 1990, that was submitted to the OEPA, was replaced on May 13, 1992 with the Radiological Controls Requirements Manual, RM-0009. The personnel exposure records are discussed in Section 18.1, which is included as Attachment B.

The new Radiological Controls Requirements Manual will be sent for the next update of the Compilation, which is due June 30, 1993.

OEPA Specific Comment No. 4:

"Use of Containments - Sec. II, Appendix E.1.5, pg. E-4

The document states to avoid the use of water inside the containment while working with contaminated materials. The use of water, however, is required in asbestos abatement. DOE needs to address, as stated earlier, the abatement of contaminated ACM."

DOE Response:

The new Radiological Controls Requirement Manual, RM-0009 states in Appendix F.1.5.d, "Avoid spraying water inside the containment since vapor will collect on the inside surfaces and obstruct vision". This is included as Attachment C.

The use of water inside containment areas for asbestos abatement, and the above statement are apparent contradictions.

Water must be used inside containment, whenever possible, to minimize the chances of asbestos fiber emissions. This is required by the NESHAPS Regulation, 40 CFR 61 Subpart M.

If, for whatever reason (radiological or otherwise) it would be necessary to remove ACM dry, appropriate request for permission to do so would be made to OEPA per NESHAPS.

OEPA Specific Comment No. 5:

"Step 1, Sec. 5.2 (Asbestos Management Plan)

DOE references OSHA Regulation 1926.58(K) for the labeling of ACM. The color scheme referenced in this regulation has been revised. Future use of warning signs will need to reflect the revised changes."

DOE Response:

The color scheme mentioned in the Asbestos Management Plan has been eliminated, and labeling has been done in accordance with OSHA 1926.58.

OEPA Specific Comment No. 6:

"Step 4a, Sec. N-5, pg. 18 (Regulatory Compliance Guide)

In order to comply with NESHAP Regulations regarding visible emissions, DOE listed three optional methods. One method was to process ACM into non-friable forms. Prior to implementing this work practice OEPA will need to review the procedures involved.

During the handling of ACWM, protection of the transport vehicle's cargo area from asbestos contamination was not addressed. OEPA suggests protecting the cargo area by lining the walls and floor with, at least, one layer of 6 mil poly sheeting. Any visible signs of ACM present after unloading will require decontamination of the cargo area."

DOE Response:

The DOE has no intention at this time to process friable asbestos waste into non-friable form. Should such a process be desirable to be developed in the future, DOE will notify the OEPA of the procedures involved for review.

Information such as mentioned regarding the cargo area for transport, will be developed when the disposal location and means of transportation become known. Any new procedures will be included in the next update to the Compilation, due June 30, 1993.

OEPA Specific Comment No. 7:

"Step 4b, Sec.1.0, pg 1 (O&M Work Practices)

DOE's statement addressing Appendix G to 29 CFR 1926.58; 'This appendix is not mandatory...', needs clarified."

DOE Response:

The entire sentence reads, "This Appendix is not mandatory because employers may choose instead to comply with all of the negative-pressure, etc. work practices requirements".

Appendix G refers to OSHA's definition of "Small-Scale, Short-Duration" projects. The provisions in Appendix G are not **mandatory**, in the sense that an employer can always use the more restrictive work practices that are necessary for large projects. The more restrictive work practices for larger projects are defined in the main text of 29 CFR 1926.58.

It is the DOE's intent to follow common industry practice, and to use Appendix G provisions whenever it is safe, practical, and allowable to do so.

OEPA Specific Comment No. 8: (O&M Work Practices)
"Step 4b, Sec. 2.2, pg 2

The definition provided contradicts what was stated earlier in the ACP. DOE also needs to clarify the time table for reinspection."

DOE Response:

The definition in Step 4b, Sec. 2.2, describes to Periodic Reinspections, and there is no reference to periodic reinspections in the ACP document.

The timetable for reinspections has been defined since submittal of the Compilation. A specific timetable for reinspecting all facilities at least once each year has been developed and is being implemented by the WEMCO Clean Air Program (Attachment D).

OEPA Specific Comment No. 9: (O&M Work Practices)
"Step 4b, Secs. 6.6.4.9 & 6.8.4.9, pgs. 25 & 31

DOE indicates the use of glovebag abatement for ACM on various mechanical apparatus. Prior to abatement involving these items the Supervisor-In-Charge of Asbestos Workers will need to dictate the type of containment to be used, either glovebag or mini-containments. Refer to sections 10.6 and 11.3.

Removal of friable ACM will not be permitted if the ACM is not contained within a sealed, physical barrier. The atmosphere inside the barrier is to be filtered by HEPA equipped air machines. Use of power tools to disturb ACM or contained material, shall be equipped with as to gather the emissions at the source and pass through a HEPA filtered exhaust."

DOE Response:

As a part of the pre-job analysis, the Industrial Hygiene Technician indicates on the Asbestos Work Permit whether either a glovebag or mini-containment will be used. This Permit is found in Step 2, page 26 of the Compilation.

References to friable ACM only being removed within a sealed, physical barrier; atmosphere inside the barrier filtered by HEPA equipped machines; and use of a vacuum with HEPA-filtered exhausts for power tools are found throughout the Asbestos Operations and Maintenance Work Practice document, Step 4b. As an example of the above, Section 7.7.4.9 states, "Using drill or saw with HEPA vacuum nozzle within several inches of blade, perform cutting or drilling while keeping area wet".

OEPA Specific Comment No. 10: (O&M Work Practices)

"Step 4b, Sec. 7.6.4.13, pg 49

Upon completing removal of ACM ceiling tile OEPA will require that the grid system, if it is to be left in place, be wet wiped or HEPA vacuumed prior to the application of encapsulating material."

DOE Response:

An analysis of the Asbestos Site Survey has revealed that there are no suspended ceilings containing asbestos at the FEMP. For this reason, this Section will be deleted in the next revised Asbestos Operations and Maintenance Work Practices Manual.

OEPA Specific Comment No. 11: (O&M Work Practice Manual)

"Step 4b, Secs. 7.11.3.2 & 7.12.3.2; pgs. 63 & 66

Incidents of this type, where asbestos fibers might have or may become airborne, require immediate attention. The Supervisor-In-Charge of Asbestos Workers shall immediately implement a plan to isolate the area. Abatement of the hazard will commence after the area has been isolated and the surrounding areas will not be jeopardized.

DOE, in addition, needs to clarify which filters are being referenced by items 7.11.4.10 & 7.12.3.2."

DOE Response:

The OEPA is correct in that a sense of urgency should be applied to "fiber release episodes". The immediate response to any fiber release episode is described in Section 5.7 ("Handling Spills or Incidents Involving Asbestos") of the Control of Work Involving Asbestos document, IH&s-IH-03. The Asbestos Operations and Maintenance Work Practice Manual defines how to do the actual clean-up, once the potential emergency procedures are completed per the Control of Work document. In the next revision of the Manual, a cross-reference will be made to the procedures in the Control of Work document.

Regarding the comment on filters, sub-sections 7.11.4.10 and 7.12.4.11 (not 7.12.3.2, as stated) are extraneous, and will be eliminated from the next revision of the Manual.

OEPA Specific Comment No. 12: (O&M Work Practice Manual)

"Step 4b, Sec. 10.4.3, pg 76

The placement of the sampling cassette two feet from the worker's breathing zone would not provide accurate exposure values. The distance needs revised to comply with this OSHA requirement."

DOE Response:

The wording of Section 10.4.3 has been changed to read, "...with an air sampling cassette attached to the hose from the pump and located within one foot of the worker's breathing zone." Section 10.4.3 also states, "Cassettes are usually taped to the worker's shoulder with the open end facing downwards on the worker's chest about 3 inches below the shoulder".

Per OSHA 1926.58, the air samples are to be taken "as close as possible" to the worker's breathing zone. It is felt that the above descriptions comply with the OSHA regulation.

OEPA Specific Comment No. 13: (Respiratory Protection Manual)

"Step 4b, Sec. 12.4, pg 83

The steps listed for the handling of respirators may expose workers to asbestos fibers. A respirator should be decontaminated immediately after each use, then inspected for defects. DOE will need to revise the procedures listed. Reference to the procedures listed in Section II, Subsection 9, governing respiratory protection, is not made."

DOE Response:

Per the Respiratory Protection Manual, the workers are required to place used respirators in a sealed plastic bag. This bag is opened in the Respirator Recycling area, which is under negative air (the exhausted air is HEPA-filtered). The respirators are then cleaned, inspected, and reconditioned if necessary for re-use, per Site Services Procedure SOP-46-C-301, "Cleaning, Inspecting, and Reconditioning Respirators". A copy of this procedure will be provided upon request.

The reference to "Section II, Subsection 9" could not be found in any of the documents submitted in the Compilation.

OEPA Specific Comment No. 14: (O&M Work Practice Manual)

"Step 4b, pg 4

The following definitions were inconclusive or contradictory to the listed word. DOE will need to revise each one: emergency renovation, EC&QA, and emergency removals."

DOE Response:

Section 4.13 should read "Emergency Demolition", not "Emergency Renovation". This has been corrected in a later revision (Attachment E).

Section 4.16 defines EC&QA, and there does not appear to be anything inconclusive or contradictory in this definition.

Section 4.22 discusses "emergency removals". To avoid any possible confusion, this term will be changed in the next revision to read "removals due to emergency demolition or emergency renovation".

Attachment A

ATTACHMENT TO WEMCO:EM:92-214

FEMP ASBESTOS ABATEMENT PLANS

Background

An Asbestos Site Survey for the FEMP was completed in February of 1992. This Survey identified and assessed the condition of all ACM, and established the abatement procedures to be used on a priority basis. A "Facility Owner's Report" has been sent to each Facility Owner, which provides the above information as well as CAD diagrams showing the physical location of the asbestos-containing material (ACM).

Several years ago, it was noticed that a considerable amount of asbestos fibers had accumulated in the gutter debris of buildings that were clad with transite roof panels. For this reason, a Transite Fiber Migration Study was performed. This Study indicated that asbestos fibers are washing from the transite roofing panels into the storm water system, and that the soil and concrete samples adjacent to transite clad buildings show a high amount of asbestos fibers as compared with control samples.

Short Term Plans (< 5 years)

The short term plans involve the prompt abatement of ACM on the site that has been identified as having the potential for exposures to site workers involved in remedial investigations at the site. This asbestos material has been classified as a potential employee protection concern more than an environmental risk, and targeted for immediate removal or other abatement.

Specifically, the ACM identified during the Site Survey has been assessed per the protocol of the Asbestos Hazard Emergency Response Act, and categorized into Hazard Ranks of 1 through 7 (where 7 represents the most hazardous condition). **Any ACM in a 4, 5, 6, or 7 ranking shall be encapsulated, encased, repaired, or removed.** Asbestos Work Orders have been written for those jobs that can be scheduled by Maintenance, and these are currently being abated by the FEMP Asbestos Team. Any jobs that cannot be done by the Asbestos Team are abated per the "Large Scale Abatement" procedures, as described in the next section.

All facilities are inspected at least annually, to ensure that the condition of the ACM has not changed. If ACM has become damaged, or for whatever reason has been re-assessed into categories 4 through 7, the ACM shall be abated.

The above simply means that some ACM that is in poor condition will be removed soon, and an undetermined - but probably small amount of ACM will be removed in the near future as its condition degrades for whatever reason. All of this will be done within the current Asbestos Management Program, specifically per the Asbestos Operations & Maintenance Work Practices Manual (OM-0005) and Control of Work Involving Asbestos document.

Large Scale Abatements Involving Health & Safety Concerns

Upon completion of the Asbestos Site Survey, there were some critical areas of the site identified as health and/or safety concerns (hazard ranking of 7) which involved quantities of asbestos too large to be designated as small scale, short duration abatements. Most of these projects focus on deteriorating transite that pose an unacceptable safety risk, and for that reason have been targeted for immediate abatement as part of the ongoing Environmental Management Asbestos Program. In addition to the Site Survey, Asbestos Consultants have examined each of these areas to confirm the seriousness of the hazard and recommend the appropriate abatement action (encasement, encapsulation, removal, repair). These projects have been reviewed and prioritized, and abatement will be done in accordance with CERCLA RI/FS concerns.

Renovations

Some asbestos will be removed as a result of renovation projects that do not necessarily involve hazardous ACM such as the recent lab renovation. These removals shall be budgeted and managed as part of the overall facility renovation, with technical program oversight provided by Asbestos Program personnel. Any such work will be done by personnel that are certified to remove asbestos in the State of Ohio.

Long Term Plans (> 5 years)

The long terms plans for the asbestos abatement focus on the ACM which is not targeted as an immediate short term health and safety hazard, but poses environmental (and worker protection) hazards during facility demolitions, and environmental weathering (transite) that occur while the FEMP is remediated. As communicated to the USEPA in the Asbestos Abatement Removal Action #26 Compendium, the current long term plans reflect information from the Asbestos Site Survey, Transite Fiber Migration Study, and the Safe Shutdown Work Plan (Removal Action #12). These long term plans will continue to evolve as other supporting documentation*, in particular the "Study for Systematic Removal of Buildings and Facilities" (due to USEPA 1/15/93) is compiled. For now, the plans generally describe how the FEMP shall address abatements involving demolitions and deteriorating transite. All major abatements will be addressed by OU3 Removal Actions.

Safe Shutdown

It is anticipated that very little abatement of ACM will occur as a part of the Safe Shutdown Program. Any abatement required will be addressed per the Work procedures within the Safe Shutdown Program (Removal Action #12 Work Plan), with technical program oversight provided by personnel from the Asbestos Management Program.

Demolitions

As facilities are scheduled for demolition, any ACM removal will be addressed as part of the Removal Action Work Plan (e.g. Plant 7 Dismantling).

The actual plan for demolition of onsite facilities will be published as a part of the "Study for Systematic Removal of Buildings and Facilities", which is due to the EPA on 1/15/93. When this Study is issued, the ACM removal for each facility can be prioritized using the information from the Asbestos Site Survey.

Transite

The Asbestos Site Survey identified only five large scale abatement projects that required immediate abatement due to deteriorating transite, but many more of the 56 buildings were observed to contain transite in various degrees of decomposition.

Based on these Survey results, the Transite Fiber Migration Study, and the inevitable weathering of untreated FEMP transite, a Transite Fiber Stabilization Study is now in progress to determine the best, general method for stabilizing deteriorating transite. The recommendations of this Study (due in October of 1992) will:

1. Present alternatives as to how to treat the transite surfaces.

2. Be tied to the Building Removal Study mentioned above, in that the treatment of transite surfaces may differ depending on whether the building will be demolished in two years, twenty years, or may remain indefinitely. This Study and the Building Removal Study will be used to prepare the details of transite abatement, which will be submitted within one month of the completion of the Building Removal Study.

3. Conform with the implementation of OU3 Response Actions.

Summary

Some key points that should be highlighted:

* ACM at the FEMP has been identified, assessed, and prioritized for abatement.

* An active program is in place to abate the most serious problems in the short term, and provide technical program oversight in the long term remediation involving non-critical ACM.

* All facilities are re-inspected annually to ensure current plans reflect the most accurate assessment of ACM hazards.

* The "Study for Systematic Removal of Buildings and Facilities" and the OU3 RI/FS will determine the (demolition) ACM removal priorities.

* The Transite Fiber Migration Stabilization Study will determine the manner in which transite panels are treated.

Supporting Documentation

A. Study for Systematic Removal of Buildings and Facilities

Identifies buildings and facilities no longer needed and provides guidance for future demolitions and renovations. Due to the USEPA on 1/15/93.

B. Work Plan for Plant 7 Dismantling

Due to the USEPA on 4/20/93.

C. Safe Shutdown Work Plan

Submitted to the USEPA on 10/31/91 in fulfillment of Consent Agreement Removal Action #9; revised and resubmitted to the USEPA in June of 1992.

D. Asbestos Site Survey

Completed on 2/28/92. Available upon request.

E. OU3 RI/FS Work Plan Addendum

Submitted to USEPA on 5/29/92.

F. OU3 Remedial Investigation Report

Due to the USEPA on 6/11/96.

G. OU3 Feasibility Study Report

Due to the USEPA on 11/5/96.

H. Transite Fiber Stabilization Study

Due to be completed 10/92.

SECTION 18 - RADIATION PROTECTION RECORDS

18.1 DOSIMETRY RECORDS - PERSONNEL EXPOSURE

18.1.1 A permanent record of exposures received at the FEMP is maintained for all personnel.

18.1.2 Completed monthly dosimetry reports shall be retained. Managers shall receive periodic reports of his/her personnel's monthly radiation exposures.

18.1.3 A summary of annual, cumulative and committed effective dose equivalent shall be provided to each employee and subcontractor radiation worker on an annual basis and shall be available to the employee upon request and upon termination of employment. Dose records shall be kept indefinitely by Dosimetry .

18.1.4 All raw data, corrected data and employee external radiation reports shall be retained in a folder labeled with the particular month and year.

18.1.5 An extremity dosimetry report shall be generated quarterly by Dosimetry with extremity dose totals for each month, e.g., a March report will contain results for January, February, and March of that year.

18.1.6 The following data shall be retained for all employees for whom monitoring is required:

18.1.6.1 Internal Exposure.

- Annual effective dose equivalent received during the year from radioactive material deposited in the body;
- Annual dose equivalent to organ or tissue of concern received during the year from radioactive material deposited in the body;
- Committed effective dose equivalent from intakes occurring during the year;
- Committed dose equivalent to organ or tissue of concern from intakes occurring during the year.

18.1 DOSIMETRY RECORDS - PERSONNEL EXPOSURE (cont.)

18.1.6.2 External Exposure.

- Annual effective dose equivalent from external sources of radiation received during the year.
- Annual dose equivalent to the lens of the eye.
- Annual dose equivalent to the skin.
- Annual dose equivalent to the extremities received during the year, including: (1) hands and forearm below the elbow and (2) feet and legs below the knee.

18.1.6.3 Summation of Internal and External Dose Equivalents

- Summation of the annual effective dose equivalents received from external and internal sources during the year.
- Cumulative annual effective dose equivalent received from external and internal sources while employed at the facility, since January 1, 1989.

18.1.6.4 Programs to Determine Individual Exposures.

Data necessary to support or re-calculate doses at a later date shall be maintained pursuant to Section 4 of ANSI N13.6-1972.

18.2 RADIOLOGICAL MONITORING RECORDS

Records of surveys, data sheets, maps, radiation work permits, health physics calculations, investigations, air sample results, worksheets and any other documentation directly related to work place monitoring shall be filed by Radiological Safety according to location (i.e., plant, building, project or location) and maintained for an indefinite length of time.

Data compiled on computer disks shall be trackable to original survey results and shall be controlled through the use of backup disks.

Documentation of work conditions affecting the results of work area monitoring shall be listed on the appropriate record with sufficient detail to allow understanding at an undefined future date. Data stored on disk shall not be construed as sufficient reason to destroy original information.

18.2 RADIOLOGICAL MONITORING RECORDS (cont.)

Laboratories (including offsite laboratories) shall maintain records of instrument serial numbers, calibration, calibration source identification, and monitoring programs, along with documentation of a complete quality control program in accordance with NRC Regulatory Guide 4.15. This information shall also be maintained indefinitely.

All radiological monitoring records shall be kept pursuant to DOE Order 1324.2A, "Records Management".

USE OF CONTAINMENTS

F.1 Use of Contamination Containment Areas

F.1.1 Discussion

The purpose of a contamination containment is to contain radioactive contamination from an open contaminated system to the smallest possible area.

Before a system is opened, it is necessary to place a protective barrier between the system and any nearby surfaces which must be kept free of contamination.

Use of containment has the following advantages:

1) Contamination is not spread by tracking out of the radiological area.

2) Individuals performing work are not exposed to contamination deposited in clothing, on skin, or internally.

3) Discomfort and physical stress from anti-Contamination clothing is avoided.

4) Less radioactive waste is generated due to not requiring anti-contamination clothes.

It may be practical and necessary to use a full tent containment for some operations, however, contamination containment should always be considered.

Thorough training of personnel in the use of containments is essential prior to installation and work. The application and choice of containment areas should be planned in advance, considering immediate work area and radiation exposure that might be received.

This appendix addresses containment use for radiological purposes only and does not consider any other contamination hazard (e.g. asbestos).

F.1.2 Types of containments Available at FEMP

All containments at the FEMP must be purchased from an outside vendor, or fabricated on site to fit the particular situation. All containments used for radiological purposes shall be approved by Radiological Engineering prior to use on site.

F.1.3 Containment Inspection Criteria

Prior to use or re-use, the containment must be inspected for damage by Radiological Safety personnel. This inspection shall include checking for pulls or tears at the corners, and for full continuous seals on the seams at a minimum. The containment inspection checklist will be used for this inspection. Containments are to be inspected daily while in use, and no containment is to be used if the inspection is over 48 hours old.

F.1.4 General Rules for Installing Containments

Complete the assembly of the containment as much as possible before taking it into a Contamination Area or Radiation Area. This makes it necessary to check the location which it will be used and take the following steps as necessary.

a. Install rubber gloves in or blank off all other glove sleeves. Try to select the proper size for users. Install right and left handed gloves in their proper places.

b. Drain lines need only be used if water is expected to drain into the containment area. If water is not expected, absorbent pads or paper will substitute for a drain. Drains are installed in the lowest part of the containment and drain either to a poly bottle or an approved floor drain.

c. Attach support cords and rubber bands to tie-offs as necessary

d. Install high efficiency filter. A 2 CFM filter is used when pneumatic tools are not used in the containment or it is at static pressure. A 40 CFM filter is used in highly contaminated systems, work requiring pneumatic tools, and in containments under high negative pressure. A high efficiency filter may not be required if a pneumatic tool is not used and a drain line is installed.

e. Cover any piping or components which will be exposed in the area with tape or sleeving to prevent them from becoming contaminated.

f. In cases where the piping or components are at temperatures above 120F and can come in contact with the containment, cover surfaces with thermal insulation material.

g. Place any equipment which is too large for the containment opening inside the containment prior to sealing.

h. Seal the containment in place using closure zipper, hose clamps, and cloth backed tape as appropriate. Do not force zippers; they glide easily when properly lined up. After closing, seal zippers using cloth backed tape.

i. Install service leads or hoses through unused glove sleeves and seal.

j. Install drop lighting outside the containment area in such a manner as to prevent light reflection from interfering with the work area. Heat from the lighting may also damage the containment area.

F.1.5 General Rules for Working in Containments

a. Wear cloth gloves inside the rubber gloves in the containment to permit rubber gloves to slide on and off easily. Rubber gloves may be used in the containment gloves.

b. Take care to prevent puncturing the containment and filter. Tape over any punctures and immediately notify Radiological Safety personnel.

c. Adjust lighting to prevent glare.

d. Avoid spraying water inside the containment since vapor will collect on the inside surfaces and obstruct vision. Always blow water out of air lines before operating them inside the containment.

e. Tap water and soap are recommended for decontamination inside containments. Volatile solvents require forced ventilation in the containment as they may create an explosive atmosphere.

f. Welding and burning is strictly forbidden from containment areas without express written permission from the Vice President of IRS&T.

g. Use only HEPA vacuums in containment areas. When vacuuming inside containment areas, use the brush attachment to prevent damage to the containment. A high efficiency filter shall be installed when using vacuum cleaners to prevent collapsing the bag.

F.1.6 General Rules for Removing Containments

a. Gently remove contaminated items from containment, items should be cleaned or bagged for removal.

b. Vacuum or wipe to clean interior surfaces of containment. Use only water and soap.

c. Remove tubing and wiring in protective sleeving by turning the sleeving inside out and twisting off.

d. Remove support cords.

e. Gently collapse containment. The vacuum cleaner may be used by sealing off the HEPA filter.

f. Carefully remove seals.

g. Gently push as much as possible of the containment into a large plastic bag and carefully cut the containment away from the component.

h. Carefully remove protective coverings and remaining tape from components which were inside the containment and place them in the plastic bag.

i. Carefully seal bag and remove from area.

F.1.7 Emergency Situations

Any breech of containment constitutes a spill and emergency action should be initiated immediately. The containment should be patched as soon as possible and Radiological Safety notified immediately.

F.1.8 Use of Plastic Bags as Containments

These bags are usually made of thin plastic material and should not normally be used as a permanent containment.

F.1.9 Containment of Mechanical Joints

When mechanical joints cannot be hydrostatically tested prior to use, these joints should be wrapped to contain any leakage. This can be with a poly bag sealed with absorbent. This containment should be inspected more frequently and the absorbent changed when it becomes saturated.

ATTACHMENT D

3602

From: D. Griffith (6539) WEMCO:EM(CAP):92-121

Date: March 30, 1992

Subject: RE-INSPECTION PLAN FOR THE FACILITIES INCLUDED IN THE ASBESTOS SURVEY

To : P. J. Beirne

I have set up a re-inspection schedule for the facilities which were included in the "Asbestos Survey". The schedule covers the coming year, and requires an inspection of several facilities each month.

To fulfill the requirements of the "Asbestos Program" there should be a yearly inspection. This inspection is necessary to record the changes/improvements in the status of asbestos at the FENP.

The following is recommended as an inspection schedule.

April 1992	Bldgs. 6; 9; 31; 46; 38; 54a
May 1992	Bldgs. 5; 12a; 10a; 1a; 11; 37
June 1992	Bldgs. 56; 66; 13a; 30a; 2a; 3f
July 1992	Bldgs. 4c; 53a; 28a; 4a; 8a; 14
Aug. 1992	Bldgs. 7; 10b; 3a; 3b; 3c; 4b
Sept. 1992	Bldgs. 3e; 20a; 24b; 60; 61; 62
Oct. 1992	Bldgs. 63; 55a; 64; 18b; 2b; 3g
Nov. 1992	Bldgs. 45; 2d; 8b; 68; 65; 25a
Dec. 1992	Bldgs. 69; 67; 3d; 19a; 2e; 15
Jan. 1993	Bldgs. 20b; 12c; 13b; 20e; 20g; 39a
Feb. 1993	Bldgs. 54b; 12b; 26a; 28b; 32; 77
Mar. 1993	Bldgs. 16a; 25c; 71; 20c; 24a; 2c

Dan Griffith

D. Griffith
Clean Air Program

DG:jld

4.0 DEFINITIONS (cont.)

Asbestos Removal Notification Form (ARNF): Form used within the FEMP to initiate submissions of Notice of Intent (NOI) to demolish or renovate structures involving asbestos. These forms are submitted to EC&QA by a maintenance supervisor, project engineer, or any person responsible for the anticipated removal.

Category I Nonfriable Asbestos-Containing Material: Any asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1% asbestos.

Category II Nonfriable Asbestos-Containing Material: Any asbestos material other than Category I nonfriable ACM containing more than 1% asbestos that when dry cannot be crumbled, pulverized, or reduced to powder by hand pressure.

Demolition: The wrecking or taking out of any load-supporting structural member of a facility together with any related handling operations.

Department of Energy (DOE): Owner of the FEMP site.

Diagnostic Engineering, Inc. (DEI): Contractor who performed the FEMP asbestos site survey.

Emergency Demolition: Any demolition conducted under a written order issued by a state or local government agency because a facility is structurally unsound and in danger of imminent collapse.

Emergency Renovation: A renovation operation that was not planned but results from a sudden, unexpected event that creates an unsafe condition. Includes operations necessitated by non-routine failures of equipment.

Encapsulate: To coat, bind, or resurface walls, ceilings, pipes, or other structures or ACM with suitable products to prevent friable asbestos from becoming airborne.

Environmental Compliance and Quality Assurance (EC&QA): The department/group responsible for ensuring compliance with the U.S. Environmental Protection Agency (EPA) NESHAP requirements for asbestos renovations or demolitions.

Facility: Any institutional, commercial, public, or industrial structure, installation, or building. For the FEMP the term "facility" refers to the entire installation and not to individual buildings or plants.

Facility Component: Any pipe, duct, boiler, tank, reactor, turbine, or furnace at or in a facility; any structural member of a facility.

ATTACHMENT II

Revised Section I of RA #26 Compendium
(Replace Section I of the original
submittal with this revision)

ASBESTOS ABATEMENT REMOVAL ACTION

INDEX

INDEX

INDEX

INDEX

* To be transmitted to USEPA as part of a future Consent Agreement deliverable or upon request.

** Previously transmitted as part of some other Removal Action documentation

Attachment II

REMOVAL ACTION NO. 26
ASBESTOS ABATEMENT REMOVAL ACTION

Introduction

In September 1991, the U. S. EPA (USEPA), and the U. S. Department of Energy (DOE) jointly signed an amended Consent Agreement pertaining to the Fernald Environmental Management Project (FEMP), formerly known as the Feed Materials Production Center (FMPC). Consistent with the terms of this amended Agreement, on January 15, 1992, a listing of potential new removal actions (termed Phase III) was submitted to the USEPA by USDOE for review and approval. This listing of potential new removal actions was subsequently approved by the USEPA at the February 25, 1992, Program Managers Meeting. One of these removal actions identified that activities performed under the scope of the current-ongoing FEMP Asbestos Program would constitute a Removal Action consistent with Section IX.F.2 of the Consent Agreement and the provisions of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The Asbestos Program was designated a Removal Action based on extensive knowledge of asbestos hazards at the FEMP, concern for the workers involved in removal or remedial action, and a recognized need to continue abatement activity as part of an ongoing program supporting the OU3 RI/FS. This Asbestos Removal Program-Removal Action is designated as number twenty-six (26), termed "Asbestos Removals (Asbestos Program)".

The January 15, 1992, Phase III submittal established that the DOE would submit asbestos work procedures consisting of a compendium of existing procedures and documentation for the ongoing Asbestos Abatement Program. This deliverable has been compiled to fulfill the terms of the agreement for Removal Action No. 26 that was submitted to USEPA on May 19, 1992.

This submittal provides a brief overview of the FEMP Asbestos Program and a review of the policies and procedures governing the program. The purpose of this submittal is to transmit to the USEPA a compilation of FEMP facility documentation supporting the FEMP Asbestos Program, while providing an overview of the scope and objectives of the Removal Action. The Removal Site Evaluation (RSE) associated with RA #26 includes a discussion of the nature and extent of the asbestos hazards on site, and provides additional background to the designation of Asbestos Program activity as a Removal Action.

Background

The FMPC was built in the early 1950's to provide high purity uranium metal and other forms to support U.S. defense initiatives. The name of the facility was changed to the FEMP in 1991 after production ceased in 1989 and the site mission changed from metals production to environmental remediation. During construction of the facility and throughout the production phase of operations, asbestos materials were used as building materials (building siding, floor tiles, ceiling tiles, etc.) and as process support materials for producing uranium and by-products (insulations, liners, etc.). Some of the asbestos

REMOVAL ACTION NO. 26
ASBESTOS ABATEMENT REMOVAL ACTION

Background (con't)

materials have become radiologically contaminated as a consequence of 37 years of production process operations. Asbestos has been identified as posing a potential health hazard and environmental contamination problem from migration induced through weathering, and the human exposures resulting from the increased potential for contact with personnel performing environmental remediation. This problem is present across the FEMP due to the extensive quantities, condition, and ubiquitous nature of asbestos and asbestos containing material (ACM).

This removal action will address the comprehensive plan for asbestos abatement at the FEMP. The ongoing and planned activities comprising this Removal Action are expected to be consistent with the final remedy identified from the Remedial Investigation/Feasibility Study (RI/FS) process. The primary regulatory drivers for Program activities are OSHA (29 CFR 1926.58), U.S. EPA NESHAP (40 CFR 61 Subpart M) and OEPA (OAC 3745-20) regulations.

As a result of concern for potential exposures to site workers and releases to the environment due to the nature and condition of the ACM, an Asbestos Abatement Program was established at the FEMP. A trained dedicated crew of Asbestos Abatement workers was formed in 1990 and an Asbestos Program Coordinator was hired to provide inter-department daily oversight of site activities involving ACM. As the site completely shifted its focus to environmental remediation, a centralized Asbestos Management Committee was organized to ensure line management involvement across departments.

REMOVAL ACTION NO. 26
ASBESTOS ABATEMENT REMOVAL ACTION

Asbestos Program

The FEMP Asbestos Program is a comprehensive program that is intended to provide management oversight for all support activities that involve asbestos containing material (ACM) or are conducted in areas where ACM is located. The Program is defined by an evolving Asbestos Management Plan that enacts an Asbestos Control Policy (see Figure 1) focusing on worker protection, prevention of environmental emissions and compliance with the applicable regulations or legal agreements. An Asbestos Management Committee (AMC), representing the principal FEMP organizations involved in abatement activities, ensures the principles expressed in the Control Policy are established by developing sitewide procedures, setting specific abatement and management goals, periodically evaluating progress towards these goals, and communicating corrective activities or general information to their respective organizations. Many of the AMC members are State of Ohio certified Asbestos Hazard Evaluation Specialists and Asbestos Hazard Abatement Specialists (AHAS), trained to ensure the Asbestos Program meets the requirements in OSHA 1926.58, OSHA 1910.120, CAA NESHAP subpart M, OAC 3745-20, DOE Orders, legal agreements and all the CERCLA regulations associated with the FEMP cleanup.

The Asbestos Program Coordinator is the chairman of the Asbestos Management Committee and reports to the Manager of the WEMCO Clean Air Program (CAP). The CAP is managed within the Clean Air and Water Programs section of the WEMCO Environmental Management Dept., to ensure that the program is ultimately managed as part of a CERCLA, multimedia (air, water, soil) environmental restoration of the FEMP.

Figure 2 is a logic flowsheet identifying the elements that comprise the Asbestos Program from identification of the hazardous material to final disposition of the removed ACM waste (covered as part of the Removal of Waste Inventories Removal Action #9). As illustrated in the FEMP Document Hierarchy (Figure 3), the various elements that comprise the Program are executed by describing the requirements (DOE Orders, Laws and Regulations, et al.) in Policy and Directives that are enacted through Sitewide and Department documents. Table I summarizes all the directives, policies, plans and procedures that constitute the site guidance documents. A step by step review of Figure 2, its relationship with the FEMP Document Hierarchy and the current site documents, best illustrates how the Program is directed to meet all the requirements.

REMOVAL ACTION NO. 26
ASBESTOS ABATEMENT REMOVAL ACTION

Asbestos Program (con't)

Step 1 - Identification of Asbestos Containing Material (ACM)
As Step 1 of Figure 2 indicates, the first element of the Program involves identification of the ACM at the FEMP. A site survey was recently completed by certified Asbestos Hazard Evaluation Specialists (AHES) who were contracted to do an Asbestos Hazard Evaluation and Response Act (AHERA) based survey of the entire site. Certified Asbestos Hazard Evaluation Specialists from the site oversaw the surveyors, and validated every aspect of the survey to ensure the sampling, analysis, labeling and disposition of the sampled material met the AHERA, OSHA and CAA requirements.

As described in Table I, the current Asbestos Management Plan is the document describing how the survey was performed, and the Asbestos Survey & Assessment report summarizes 3000 pages of detailed information from the evaluation of 74 buildings. Over 2,500,000 sq. ft. of asbestos transite, 120,000 linear ft. of asbestos insulation and 32,000 sq. ft. of miscellaneous ACM (tile, etc.) have been identified in 56 buildings on site. The Site Survey is part of the supporting documentation in the Administrative Record for Operable Unit (OU) 3, and was transmitted to the DOE Fernald Office, February 28, 1992.

Step 2 - Characterization of the ACM
The original Asbestos Management Plan (AMP) also provided for a two step characterization of the ACM, utilizing the AHERA hazard ranking, and the Air Force "grade" algorithm to assess the condition and potential for disturbance of the material. Each homogeneous area was numerically prioritized to categorize the material for in situ maintenance or removal. The survey is kept current through ongoing site hazard assessments (Step 7) performed by certified AHES and Industrial Hygiene technicians. Facility reinspections are also conducted annually in the presence of certified AHES, and the survey records are updated by OSHA competent Clean Air Program (CAP) personnel to reflect progress in ongoing asbestos abatement projects.

In addition to the Asbestos Management Plan, the "Control of Work Involving Asbestos" document and the Industrial Hygiene & Safety Manual provide guidance during any of the work required to characterize the ACM.

Step 3 - Determining the Appropriate Abatement
The Step 3 determination of appropriate abatement is a process that involves a comprehensive evaluation of the hazards of the ACM and the other CERCLA hazardous substances within the particular facility. The National Environmental Policy Act (NEPA) documentation is prepared per SOP-FMPC-0518 to determine whether an Environmental Assessment or Environmental Impact Statement is appropriate. Friable material with a significant hazard ranking, as described in the AMP and quantified by the Site Survey, is

Asbestos Program (con't)

targeted for immediate abatement. Non-friable asbestos is evaluated with information from the ongoing Health & Safety Hazard Assessments (Step 7), the OU3 RI/FS, Safe Shutdown Program, and other OU3 removal actions (Step 8) to determine whether abatement is appropriate and compatible with final remedial design for OU3. Since much of the ACM on site is presently non-friable, the consideration for radiological concerns is often as great as the hazard associated with airborne asbestos. Thus, ongoing abatement activity to address the potentially more hazardous ACM on site is performed by a dedicated team of asbestos workers who are certified by the Ohio Department of Health (DOH) as asbestos hazard abatement specialists, and, who are also trained in the other radiological, physical, and chemical hazards at the FEMP.

Step 4a - Agency Notification
Once the determination of the appropriate action has been made, the Southwest Ohio Air Pollution Control Agency (SWOAPCA) is notified of demolition and renovation activities, as described in Step 4a. These notifications are made according to department procedure N-5, 90-100 and these Notices of Intent (NOIs) are also copied to the OEPA DOE Coordinator's office for demolitions or renovations involving quantities of ACM greater than the CAA NESHAP subpart M reportable quantity. This fulfills the reporting requirements of 40 CFR 61.145 and OAC 3745-20.

In October 1991, all asbestos abatement activities at the FEMP were categorically excluded from further National Environmental Policy Act (NEPA) documentation for 1992 and 1993. Additional documentation for 1994 and beyond will be processed per SOP-FMPC-0518 when the present exclusion expires.

Step 4b - In situ Maintenance
If it is determined that small scale, short duration abatement work or wet wrapping is required, the site Asbestos Operations & Maintenance (O&M) manual and IRS&T department procedures ("Control of Permits for Accomplishing Hazardous Work", "Issuing Permits for Asbestos Work") detail the in-situ maintenance or minor removal/renovation practices to be followed in Step 4b.

These standards comply fully with the construction and general abatement requirements of OSHA 1926.58 and OSHA 1910.120 for small scale, short duration work. All work performed is done by trained abatement workers or DOH licensed asbestos abatement contractors.

REMOVAL ACTION NO. 26
ASBESTOS ABATEMENT REMOVAL ACTION

Asbestos Program (con't)

Step 5 - Asbestos Removal
When large scale removals, demolitions, or renovations involving ACM are required (Step 5), the major abatement projects require oversight by the Industrial Hygiene Section, as described by the department procedure "Control of Work Involving Asbestos." This document, coupled with the procedures for specifying how and when to issue site permits for asbestos abatement or hazardous work, provides for the necessary program management oversight to ensure compliance with the removal and renovation requirements in OSHA and CAA regulations.

The Asbestos O&M manual also provides guidance for minor removals, consistent with the "Control of Work" documents. Interim storage of the removed ACM is addressed in the Waste Management procedure for "Control and Utilization of Contaminated Trash Dumpsters".

Step 6 - Asbestos Waste Management
As Step 6 and the Asbestos Control Policy indicate, removed waste is managed as part of the comprehensive Waste Management Program at the FEMP. This program was previously described in an earlier compendium submittal for Removal Action #9. To ensure a safe program transition after the material is removed, packaging requirements specified by the "Packaging of Low Level Waste" procedure, and directions previously discussed in the "Control & Utilization of Contaminated Trash" procedure, provide guidance for the preparation of asbestos waste for management within the sitewide Waste Management Program.

Presently, there are approximately 1,000,000 lbs. of packaged ACM waste stored at the FEMP. Most, if not all, of this material is targeted for shipment to the Nevada Test Site (NTS) as low level radioactive waste. Authorization to ship contaminated asbestos waste is still being negotiated with NTS, but other DOE and commercial asbestos landfills are being considered. On site segregation of radiologically contaminated ACM from non-radiologically contaminated material is being pursued in an effort to broaden the possibilities for off site disposal, as well as reduce the costs and burden of burial as low level waste at NTS.

Step 7 - Ongoing Hazard Assessment
During the implementation of the Asbestos Program from the first step "Identification of the ACM" hazard to its "Removal" (Step 5) and final disposition under "Waste Management" (Step 6), the age and condition of the asbestos material require surveillance and assessment to ensure the current characterization of the ACM is accurate.

REMOVAL ACTION NO. 26
ASBESTOS ABATEMENT REMOVAL ACTION

Asbestos Program (con't)

DOE Order 5480.10 prescribes the type of Industrial Hygiene Program that is required to ensure hazards such as ACM are routinely investigated. The Industrial Health & Safety manual defines the specific requirements and responsibilities for performing hazard assessments and the Control of Work procedure details the precautions to be taken during the work involving asbestos.

Step 8 - Long Term Plans
Short term (< 5 years) plans for abatement of (friable) asbestos that has been given an AHERA hazard ranking greater than four have been fully developed, and are currently being executed as part of the ongoing Asbestos Program abatement activities. **General, long term** (> 5 years) **plans** have also been developed, and both sets of plans are described in the "FEMP Asbestos Abatement Plans" included in Section III, Step 8.

As the condition and quantities of ACM are subject to change, other activities at this site effect and sometimes mandate changes in the plans for removal or in-situ maintenance of asbestos. As a result, **more detailed long term plans** for removal or in-situ maintenance of asbestos are presently being developed compatible with the "Study for Systematic Removal of Buildings and Facilities", "Plant 7 Dismantling Work Plan", "OU3 RI/FS Work Plan Addendum", "OU3 Remedial Investigation Report", and the "OU3 Feasibility Study Report". All of these documents are scheduled for submittal after this Removal Action Compendium, so the current plans only reflect information from the "Asbestos Survey Assessment for the FEMP" and the "Safe Shutdown Work Plan". Those plans call for the immediate abatement of nearly 3,000 linear ft. of asbestos pipe insulation and approximately 100,000 sq. ft. of deteoriated asbestos transite from five buildings at the FEMP. The demolition of Plant 7 also involves asbestos removal, but that non-critical abatement will be performed as part of Removal Action #19, and is considered part of a **long term** abatement project. Another 75 minor removals will be scheduled to address the ACM requiring immediate attention (hazard ranking of 7), as identified during the Site Survey.

Steps 9 and 10 - Training and Quality Assurance
Steps 9 and 10 identify the Training and Quality Assurance support systems that are designed to ensure that all the ACM regulatory requirements, Asbestos program site procedural requirements and related hazardous material requirements are not only communicated, but are implemented correctly, and updated to represent the most accurate information available.

REMOVAL ACTION NO. 26
ASBESTOS ABATEMENT REMOVAL ACTION

Asbestos Program (con't)

As described in almost every preceding step, training is an integral part of nearly every element of the Asbestos Program. General sitewide hazard training per the requirements of OSHA 1910.120 is administered by the Centralized Training section of the IRS&T department. Additional specific Asbestos Program training, performed by EPA approved trainers, is provided for Asbestos Abatement workers and their supervisors.

The FEMP "Asbestos Training Requirements" mandated for the supervisors and Asbestos abatement workers exceeds the requirements specified in OSHA 1926.58, as all abatement workers receive EPA approved 32 hour OSHA 'competent person' training, regardless of the size of the abatement activity. All site personnel receive Asbestos Awareness training as part of the accredited sitewide training program developed to meet the requirements of OSHA 1910.120.

Additional OSHA training for facility owners and other personnel is provided to ensure individuals responsible for buildings containing ACM have a heightened awareness of their particular hazards.

A system for performing self-assessments and asbestos program evaluations pursuant to the DOE Self-Assessment Guidance Document has been instituted to ensure training, program elements and site documents are kept current with newly promulgated regulations or revisions to existing requirements. Audits along with other Asbestos Program quality assurance surveillances, are performed in support of this process. These complement the implementation of the sitewide Quality Assurance Plan, and ensure that the work practices follow the updated documents. Violations are noted in QA Deviation Corrective Action Reports that are reported to the Environmental Management department, where plans to correct the problem are developed and managed to completion.

General Information about Steps 1-10 and the Compendium

It is recognized that revisions to existing policies and procedures to respond to evolving program needs or unique site conditions are an integral part of a successful program. The enclosed procedures are intended to be a living document, meeting current regulatory requirements while retaining the flexibility to respond to changes in an efficient manner. Changes or updates to the provided documentation may be necessary to ensure the continuity of operations, based on new requirements. Consistent with arrangements made in the January 15, 1992, Phase III annual review of potential new removal actions, updates to the compendium of existing procedures and documentation for the ongoing Asbestos Abatement Removal Action shall be submitted to the USEPA for review and approval on an annual basis, commencing on June 30, 1993.

REMOVAL ACTION NO. 26
ASBESTOS ABATEMENT REMOVAL ACTION

Integration with the Operable Unit 3 (OU3) RI/FS

The inventory of asbestos and asbestos contaminated materials that currently exist on pipes, buildings, walls, tanks, and other surfaces of equipment used in the nine production plants are within the scope of OU3 of the ongoing site-wide RI/FS.

Integration with the Operable Unit 3 (OU3) RI/FS (con't)

Consistent with the provisions of the NCP, removal actions shall be appropriately integrated with the ongoing RI/FS, including ensuring that appropriate documentation is entered into the Administrative Record. This integration is required to document any action taken which may affect site conditions relative to the Operable Unit as well as to ensure the removal action is supportive of potential final remedial objectives. Within the FEMP Administrative Record, a separate file shall be established for placement of supporting documentation for the Asbestos Removals (Asbestos Program) Removal Action No. 26. Included in the Administrative Record file will be all key program documentation, including this Work Plan submittal consisting of current Asbestos

Abatement Removal Action work procedures, and a compilation of appropriate materials disposition records for ACM, are encompassed within this Removal Action.

The implementation of Asbestos Abatement Removal Action activities clearly supports the remedial objectives for Operable Unit 3 by providing a necessary preliminary step for preparation of these areas for subsequent remedial activities. The Program actions are consistent with final remedial actions based on the fact that mitigation of personnel/environmental risk and safe, permanent disposition of FEMP wastes/materials are ultimate goals.

Close coordination will be maintained with the ongoing RI/FS for OU3 and other removal actions to ensure that planned activities appropriately support RI/FS field investigations and alternative evaluations by incorporating interim abatements of ACM into baseline risk determination and site characterizations.

ASBESTOS CONTROL POLICY

Figure 1

All FEMP activities that involve asbestos containing material (ACM), or are conducted in areas where ACM is located, will be performed in such a manner as to protect employees from harmful exposures, prevent environmental emissions that endanger public health or the environment, and ensure compliance with the regulations and legal agreements addressing such activities.

In support of this policy statement, the following corollaries describe the fundamental principles upon which the Asbestos Management Plan and the Program organization have been established:

- A committee shall be established and be comprised of the most knowledgeable individuals, representing the principal organizations involved in abatement activities at a level closest to the level of execution, to develop and update asbestos policies and procedures, set specific site goals, periodically evaluate progress, communicate information to their respective organizations, and self assess the Asbestos Program.

- Adequate training shall be provided to ensure all employees understand the hazards of ACM in their work area and that abatement workers can demonstrate the procedures designed to accomplish their work, while protecting employee and public health and the environment.

- Asbestos abatement activities shall be communicated to SWOAPCA and performed according to the site specific procedures incorporating worker protection (OSHA 1926.58) standards, environmental standards (40 CFR 61, subpart M) and the other requirements detailed in the Asbestos Management Plan, as verified by self assessments and internal surveillance audits.

- ACM will be identified, and initial hazard assessments used, to plan short term (<5 years) abatement activities within an evolving program. Since asbestos abatement is part of a thirty year cleanup plan for the FEMP, and the scope of the project involving hazard abatement extends beyond asbestos, asbestos management is continually changing to reflect current regulations and the overall site activities regarding hazard abatement. The Asbestos Program (AP) will be managed within the Clean Air Program (CAP) of the Environmental Management Department where AP activities will be planned, budgeted and scheduled consistent with the CERCLA based cleanup. Activities across and within departments will be coordinated by the CAP Asbestos Program Coordinator.

- Long term removal plans will be developed in five year increments for the life of the FEMP as part of the Asbestos Management Plan (AMP). The AMP will be annually updated to reflect the changing scope of the CERCLA remedial effort and the relative hazard of the ACM.

- Storage and disposal of removed ACM at the site will be managed as part of the comprehensive Waste Management Program at the FEMP.

- A compendium of the procedures used to control ACM will be forwarded to USEPA and annually updated and reissued in an effort to integrate asbestos abatement work with the CERCLA cleanup of the FEMP. REV. 2- 3/31/92 PJB

Logic Flow Chart for Asbestos Program

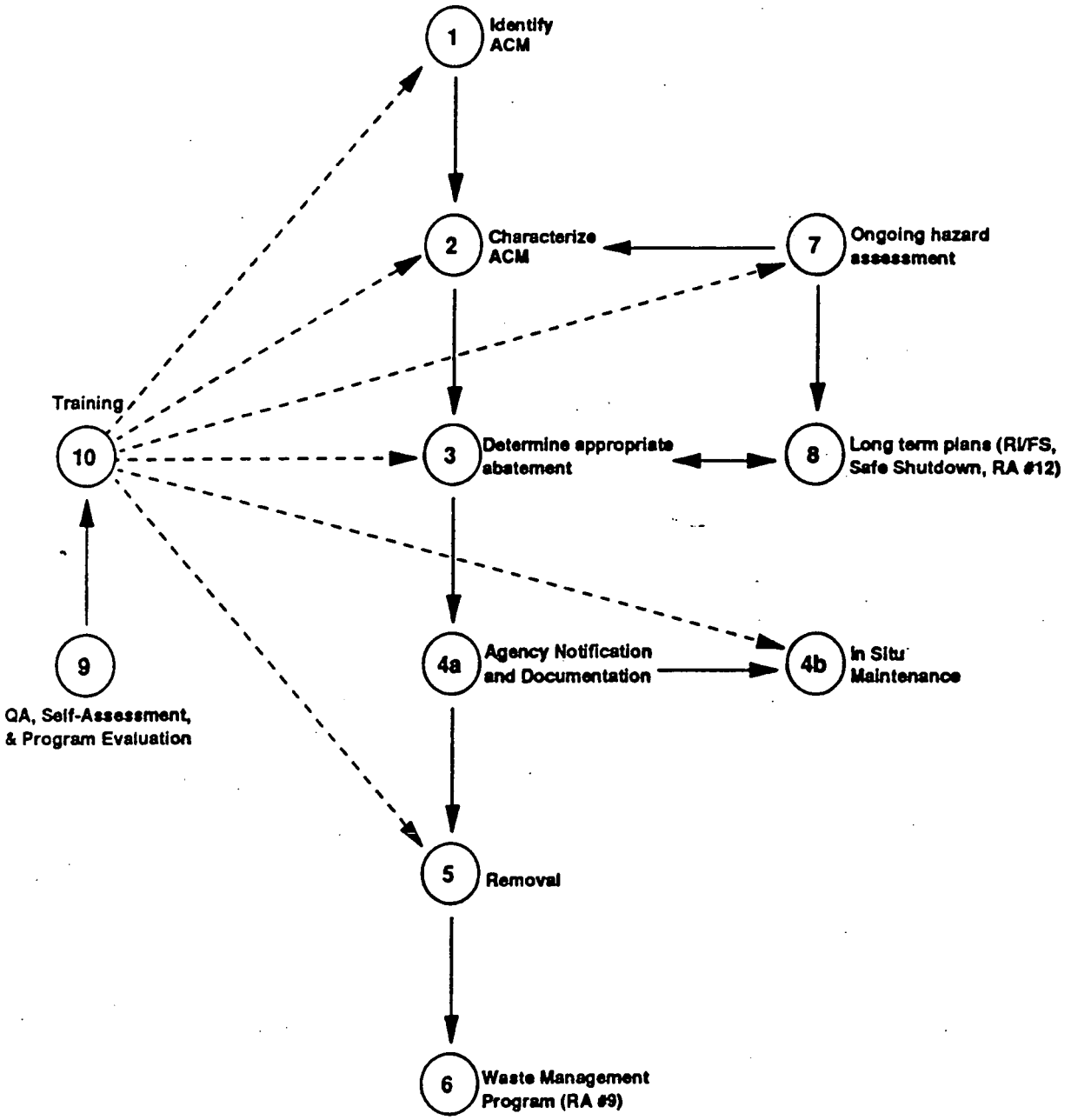
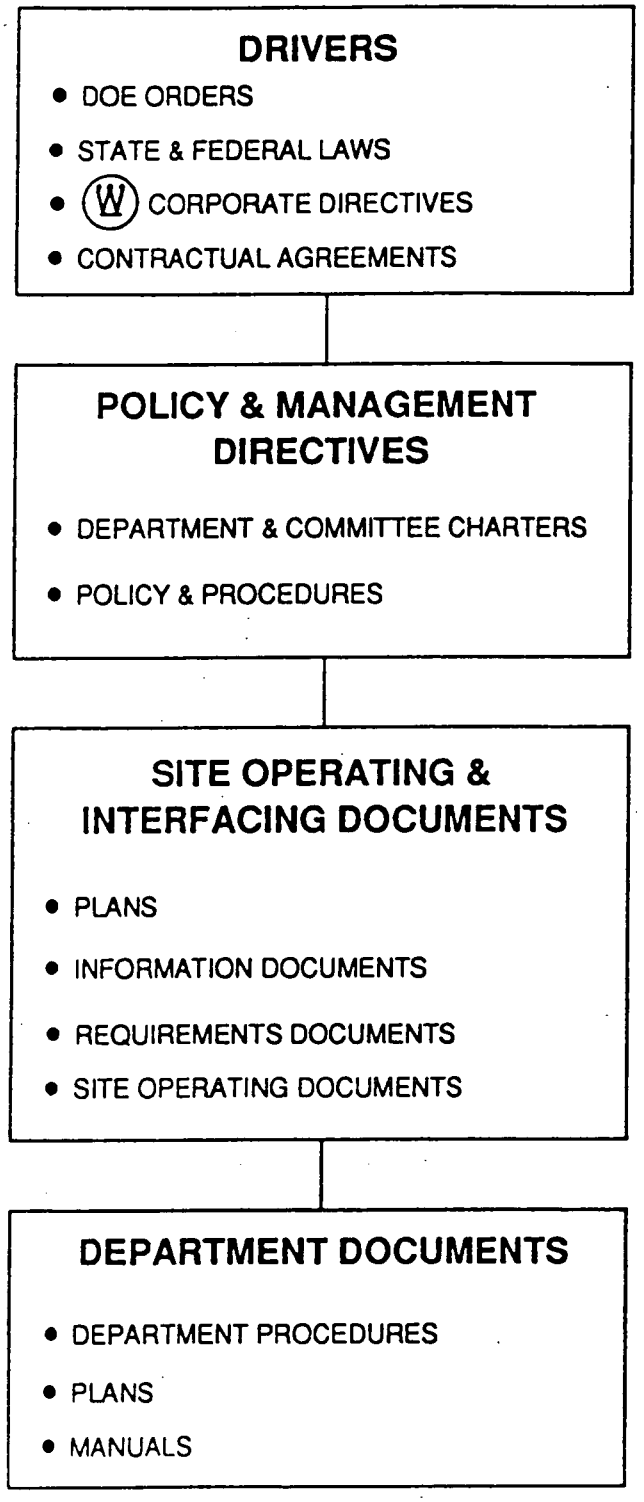


Figure 2

FIGURE 3

ASBESTOS REMOVALS - ASBESTOS PROGRAM

WEMCO SITE DOCUMENT PROGRAM HIERARCHY



CHARTER - A document defining the work scope & responsibilities of a department, committee, council, board or function.

POLICY & PROCEDURE - A statement of management policy followed by a series of administrative instructions, including responsibilities & principal actions affecting two or more departments.

PLAN - A document identified as required by a driver or information defining actions to be taken to meet a requirement.

INFORMATION DOCUMENT - Information compiled on a subject and presented to be informative for personnel of the FEMP or as required by external organizations.

REQUIREMENTS DOCUMENT - A document defining requirements for an activity affecting two or more WEMCO organizations.

SITE OPERATING DOCUMENT - A procedure that provides detailed operating instructions for an activity to two or more WEMCO organizations.

DEPARTMENT PROCEDURE - A procedure that provides instructions to only one WEMCO organization.

PLAN - A document identified as required by a driver for only one WEMCO organization in order to meet a requirement.

MANUAL - A document that provides detailed requirements/ instruction affecting only one WEMCO organization.

TABLE I

STEP (Section II Procedures)	GENERAL SUPPORTING DOCUMENTATION	DESCRIPTION/COMMENTS
GENERAL	IN-FMPC-6007, Site Documentation System	This site procedure defines the system of documents by which the FEMP is managed and details the requirements for development, preparation and control of these documents.
	SSOP-0023, Deviation and Corrective Action Reporting	This procedure identifies the assigned responsibilities and required actions for identifying, documenting, evaluating and providing dispositions and corrective action plans for deviations and corrective actions observed during audits, reviews, surveillances, inspections or tests performed at the Site by both internal and external organizations, as well as the evaluation of supplier-proposed dispositions and corrective actions plans.
	RM-FMPC-0002, Centralized Training Program Manual*	This site manual establishes the requirements for all personnel involved in the development and delivery of training. The manual is prepared in accordance with DOE Order 5480.18. The manual also references the DOE Training Accreditation Program (TAP) Manuals. Copies of this document will be made available upon request.

TABLE I

STEP (Section II Procedures)	GENERAL SUPPORTING DOCUMENTATION	DESCRIPTION/COMMENTS
GENERAL	FMPC-2139, FMPC Quality Assurance Plan*	This site manual incorporates the policies for achieving or exceeding the required quality levels in the operation of the Site. The program is based on the criteria specified in ANSI/ASME NQA-1. DOE Orders 5700.6 and 5700.6B specify NQA-1 as the preferred standard for Quality Assurance. Copies of this document will be made available upon request.
	FMPC Site Health and Safety Plan*	This site plan provides the overall means for planning and implementing the job site characterization, health, and safety training and job orientation for personnel. Copies of this document will be made available upon request.
	Asbestos Control Policy	This Environmental Management Directive provides guidance and an outline for an Asbestos Management Plan and Program that protects FEMP employees, prevents environmental emissions and meets all regulatory requirements or FEMP legal agreements.

TABLE I

STEP (Section II Procedures)	GENERAL SUPPORTING DOCUMENTATION	DESCRIPTION/COMMENTS
GENERAL	ASBESTOS MANAGMENT COMMITTEE CHARTER	This non-operational document details the responsibilities of the Asbestos Management Committee that was organized to ensure line management responsibility for implementing the Asbestos Control Policy and Management Plan.
	FMPC RESPIRATORY PROTECTION MANUAL, FMPC-2152	This non-operational document describes the Personal Protective Equipment required for all hazardous material work, citing specific asbestos respiratory requirements.
	MANAGEMENT OF HAZARDOUS WASTE, FMPC-0519	This Management Directive provides general guidance for the preparation of removed ACM for management in the FEMP Waste Management Program.
	FEMP RADIATION CONTROL MANUAL, FMPC 2084	This non-operational manual presents the specific radiological control requirements and protective measures that are to be employed at the FEMP.
	RADIATION CONTROL, FMPC-505	This procedure identifies the safety requirements and assigns the responsibilities for the control of radioactive materials and personnel radiation exposure and contamination at the FEMP.

TABLE I

STEP (Section III Procedures)	IMPLEMENTING PROCEDURES	DESCRIPTION/COMMENTS
STEP 1 Identification of ACM	ASBESTOS MANAGEMENT PLAN, PL-FMPC-3002	This Site Operation Work Plan details the methodology for identification and hazard assessment of ACM on site. Now that the Site Survey is complete, this document is currently being revised to describe the entire asbestos program in a non-operational plan.
	ASBESTOS SURVEY & ASSESSMENT FOR THE FEMP*	This report identifies and provides an assessment of the ACM at the FEMP during CY1991. It is currently being updated to reflect continuing abatement actions that are part of the Asbestos Program removal/remediation actions or other CERCLA removal/remedial actions, in an effort to keep the inventory accurate for final OU3 remediation. Copies of this document can be made available upon request.

STEP 2 Characterize ACM	CONTROL OF WORK INVOLVING ASBESTOS, IH-03	This IH section document provides general guidance and requirements for all work involving asbestos, focusing primarily on abatement work (contractors and WEMCO personnel). Section 5.7 describes emergency procedures i.e. handling spills or incidents involving asbestos.
	ASBESTOS MANAGEMENT PLAN PL-FMPC-3002	See above description/comments as described in Step 1.
	ASBESTOS SURVEY AND ASSESSMENT FOR THE FEMP*	See above description/comments as described in Step 1.
STEP 3 Determine appropriate abatement	COMPLETION OF NEPA DOCUMENTATION, SOP-FMPC-0518	This procedure describes the NEPA documentation Program.
	ASBESTOS MANAGMENT PLAN, PL-FMPC-3002	See above description/comments as described in Step 1.
	OU3 RI/FS WORK PLAN ADDENDUM	Due to U.S. EPA 6/2/92.
	ASBESTOS SURVEY AND ASSESSMENT FOR THE FEMP*	See above description/comments as described in Step 1.
STEP 4a Notify Regulatory Agencies and document removals, renovations, and demolitions involving ACM	NOTIFICATION PROCEDURES, RCG-90-100	This Site Standard Operating Procedure ensures that all removals, renovations and demolitions involving asbestos at the FEMP are conducted with proper regulatory notification.
	COMPLETION OF NEPA DOCUMENTATION, SOP-FMPC-0518	This policy describes the NEPA documentation program.

STEP 4b In situ Maintenance for Operations and Maintenance (O&M)	ASBESTOS OPERATIONS & MAINTENANCE MANUAL, IN-6029	This Site Operation document provides a detailed description of procedures to be followed during small scale, short duration asbestos work, performed primarily by WEMCO personnel.
	CONTROL OF PERMITS FOR ACCOMPLISHING HAZARDOUS WORK, FMPC-0516	This procedure establishes positive means for controlling work tasks that involve all hazardous or potentially hazardous materials, equipment, operations or activities. The procedure describes the responsibilities and means for control of work by WEMCO employees, subcontractor personnel, and/or others involved with any of the following activities: working with asbestos; working on a chemically-hazardous system; open flame and/or welding activities; working with a radioactive material; and entering or working in a confined space.
	ISSUING PERMITS FOR ASBESTOS WORK, SP-P-41-006	This section document provides specific instruction to ensure that exposures of employees to asbestos are prevented or within acceptable limits by having IH techs. preview the procedures for any job involving asbestos-containing materials.

STEP 5 Removal	CONTROL OF WORK INVOLVING ASBESTOS, IH-03	This document details the Health & Safety requirements for <u>any</u> asbestos work performed by WEMCO or subcontractor personnel at the FEMP.
	CONTROL AND UTILIZATION OF CONTAMINATED TRASH DUMPSTERS, 20-C-604	This department procedure describes the responsibilities for control of contaminated waste prior to offsite disposal.
	ASBESTOS OPERATIONS & MAINTENANCE MANUAL, IN-6029	See above description/comments as described in Step 4b.
	CONTROL OF PERMITS FOR ACCOMPLISHING HAZARDOUS WORK, FMPC-0516	See above description/comments as described in Step 4b.
	ISSUING PERMITS FOR ASBESTOS WORK, SP-P-41-006	See above description/comments as described in Step 4b.
STEP 6 Waste Management Program	PACKAGING, ON-SITE MOVEMENT AND OFF-SITE SHIPMENT OF MATERIAL, PP-0134	This department SOP describes the packagaing that must take place to ship (asbestos) material offsite. (NVO-325 requirements)
	LOW LEVEL WASTE MANAGEMENT PROCEDURES	See Compendium describing waste management program submitted to USEPA 8/31/91 to fulfill Consent Agreement (CA) IX1.b, "Removal of Waste Inventories," Removal Action (RA) #9.

STEP 7 Ongoing hazard assessments	DOE Order 5480.10, "Contractor Industrial Hygiene Program"	This Site Standard requirement guidance for the Industrial Hygiene Program, establishing a program for regular hazard assessments that is monitored by certified Industrial Hygienists.
	IH&S Manual, FMPC 2128	This Industrial, Radiological Safety and Training (IRS&T) department document details the specific Health & Safety practices that ensure worker protection from all FEMP hazards, including asbestos.
	CONTROL OF WORK INVOLVING ASBESTOS, IH-03	See above description/comments as described in Steps 2 & 5.

STEP 8 Long Term Plans (RI/FS; Safe Shutdown, RA #12)	FEMP Asbestos Abatement Plans	Provides a general description of the short (< 5 years) and long term plans for the abatement of potentially friable and non-friable ACM, respectively.
	Study for Systematic Removal of Buildings and Facilities*	Ref. CA 1X.4, this study will identify buildings no longer needed and will provide guidance for future demolitions and renovations which is key to determining appropriate abatement actions. Due to USEPA 1/15/93.
	Work Plan for Plant 7 Dismantling*	Ref. CA 1X.2, the Work Plan for Removal Action #19 is to be transmitted to USEPA 4/20/93.
	Safe Shutdown Work Plan*	Submitted to USEPA 10/31/91 in fulfillment of (CA) Consent Agreement Removal Action (RA) #9.
	Asbestos Survey & Assessment*	Completed 2/28/92. Available upon request.
	OU3 RI/FS Work Plan Addendum*	Due to USEPA, 6/2/92.
	OU3 Remedial Investigation Report*	Due to USEPA, 6/11/96.
	OU3 Feasibility Study Report*	Due to USEPA, 11/5/96.

STEP 9 Self-Assessment and Program Evaluation	Asbestos Program Internal Audit/Self-Assessment System DOE Self-Assessment Guidance Document	This Non-operational Plan details the schedule and contents of the Asbestos Program Self-Assessment and QA Audit system. This Site Standard requirement outlines the self-assessment program DOE facilities are required to have to ensure continuous program improvement.
STEP 10 Training	Asbestos Program Training Matrix	These Site Standard Requirements describe the Asbestos Program training requirements for Abatement workers, Supervisors of Abatement workers, Facility Owners and all other site personnel.

ASBESTOS PROGRAM
LIST OF ACRONYMS

ACM	- Asbestos Containing Material
AHAS	- Asbestos Hazard Abatement Specialist
AHERA	- Asbestos Hazard Evaluation Response Act
AHES	- Asbestos Hazard Evaluation Specialist
AMC	- Asbestos Management Committee
AMP	- Asbestos Management Plan
ARAR	- Applicable or Relevant and Appropriate Requirement
BI/MP	- Building Inspector/Management Planner
CA	- Consent Agreement
CAA	- Clean Air Act
CAP	- Clean Air Program
CERCLA	- Comprehensive Environmental Response, Compensation, and Liability Act
DOE	- Department of Energy
DOH	- Ohio Department of Health
EC&QA	- Environmental Compliance and Quality Assurance Department
IRS&T	- Industrial, Radiological Safety and Training
NCP	- National Contingency Plan
NEPA	- National Environmental Policy Act
NESHAP	- National Emission Standards for Hazardous Air Pollutants
OAC	- Ohio Administrative Code
OU3	- Operable Unit 3
QA	- Quality Assurance
RA	- Removal Action
RI/FS	- Remedial Investigation/Feasibility Study
ROD	- Record of Decision

ASBESTOS PROGRAM
LIST OF ACRONYMS

SOP	- Site Operating Procedure
SWOAPCA	- Southwest Ohio Air Pollution Control Agency
TAP	- Training Accreditation Program
USEPA	- United States Environmental Protection Agency
WEMCO	- Westinghouse Environmental Management Company of Ohio (previously WMCO)
WMCO	- Westinghouse Materials Company of Ohio (now WEMCO)

ATTACHMENT III

Removal Site Evaluation for RA #26

TECHNICAL INFORMATION FOR

REMOVAL SITE EVALUATION

AUGUST 1992

Sitewide Asbestos Abatement Program

TABLE OF CONTENTS

1.0 Introduction

The majority of the facilities at the Fernald Environmental Management Project (FEMP) were constructed prior to 1970, and therefore asbestos containing materials (ACM) were utilized in various building materials. Insulation materials containing asbestos were used for pipelines, ductwork and vessels requiring thermal insulation. Transite (asbestos-cement board) was widely used for inner and outer building sheathing for many process buildings, warehouses, and support buildings. Floor coverings containing asbestos were used in offices, laboratories, and service areas. Asbestos was also used in miscellaneous materials such as gaskets, brake and clutch linings, lab oven linings, electrical conduit, and plant oven linings/seals.

Currently, the FEMP has an active, ongoing asbestos abatement program.

This Removal Site Evaluation (RSE) has been completed by the DOE under authorities delegated by Executive Order 12580 under Section 104 of CERCLA and is consistent with Section 300.410 of the National Oil and Hazardous Substance Pollution Contingency Plan (NCP). This RSE addresses whether current asbestos abatement activities at the FEMP satisfy CERCLA requirements.

2.0 Source Term

There are two sources for characterizing ACM at the FEMP. The first source is the Asbestos Site Survey, and the second is the Transite Fiber Migration Study.

2.1 A comprehensive Asbestos Site Survey was completed in February of 1992. This Survey detailed the location of ACM; assessed the hazardous nature of ACM, and recommended response actions.

The protocol used for sampling and analysis was in accordance with the Asbestos Hazard Emergency Response Act (AHERA). (Although AHERA was developed for application in public and private schools, it has been universally accepted as the "de facto" standard of care to be used for other types of facilities.)

Bulk samples were taken of any material that was suspected to contain asbestos, and these samples were analyzed by an accredited laboratory. If asbestos was present, results were reported not only as a percentage of the sample, but also by type of asbestos - chrysotile, amosite, etc.

Figure A-1 shows the data from the Site Survey by category of usage. From this table it can be seen that while there are 29 different categories of usage of ACM at the FEMP, by far the most extensive are the 62,874 linear feet of pipe insulation and lagging, and the 2,424,218 square feet of transite sheet material.

The Asbestos Site Survey indicated that of the 26 transite-cladded facilities at the FEMP, 4 buildings had transite panels that were in deteriorated condition and posed either safety or health problems.

These areas are:

Plant 2/3 - Digestion Area, and the West End of the Extraction Area

Plant 6 - Scrap Pickling Area

Metal Dissolver Building - Exterior

Hot Raffinate Building - Two Interior Areas

2.2 To determine if asbestos fibers were being released from the surface of transite panels, a Transite Fiber Migration Pilot Study was initiated and completed in February, 1992. The experimental design of the pilot study included collection of surface soil samples from soils adjacent to transite-clad buildings, gutter sediment samples, surface dust samples from sidewalks and pavements, and air samples related to the routine sweeping of streets.

2.2.1 Soil Samples - Table I

Buildings 2a, 4a, and 20a were selected as test sites for soil sampling. All of these buildings have gravel-covered soil in direct contact with the buildings' concrete foundations. Sampling locations at each building were chosen following a simple sampling protocol. When possible, samples were taken three feet away from the building foundation and evenly spaced along the side of the building.

Six surface soil grab samples were collected at each test site. The area to be sampled was marked using a 10 cm. x 10 cm. (100 sq. cm.) template. Enough soil to fill a 125 cu. cm. precleaned glass bottle (VWR Cat. No. 16194-041) was collected at each sampling location to an approximate depth of 1 cm. with the aid of a stainless steel spatula. Sampling was performed after removal of surface gravel. The gravel layer at each sampling location varied from 1/4 inch to several inches in depth. The inclusion of some gravel with each soil sample, especially when sampling in sandy soils, was unavoidable.

A set of control soil samples were collected at a transite-free building known as Building #73 Fire Brigade Training Center located about 100 yards outside the north security fence of the production area. These samples were humus rich soils characteristic of the farm land which surrounds the facility.

The sample preparation and analytical method used was based on the methodologies proposed by Hayward and Lowe, and Kramer and Millette as follows:

Once in the laboratory, the individual soil samples were dried and then inspected under a stereo-microscope and photographed. Each sample was then divided into two similar portions. One portion was kept intact for archive purposes, while the remaining portion was dried, weighed, ashed in a muffle furnace at 480 degrees C for 8-12 hours, and weighed again to determine the amount of organic material present. At this point, all samples from each test site were combined to yield one homogeneous composite sample per test site. Homogenization was accomplished using a tumbler designed and built in the laboratory for this purpose. The ashed composite samples were then ground in a SPEX Mixer Mill for one minute. This grinding time was sufficient to produce individual fibers or small fiber bundles as required by the analytical method.

Preparation of the samples for transmission electron microscopy (TEM) analysis followed. Six sub-samples (aliquots) from each composite soil sample were prepared. A 0.01-g aliquot of the ground sample was suspended in 100 ml of ultra pure deionized water. One Ml of 0.1% aerosol OT (10% solution of sodium dioctyl sulfosuccinate) was added to this suspension to ensure uniform fiber dispersion. The suspension was then mixed thoroughly and sonicated for one hour. Suspended particulates were collected onto a 0.45 micrometers mixed cellulose ester (MCE) filter membrane by filtering a 1-Ml aliquot of the total suspension. Once dried, the MCE filter was prepared for TEM analysis in accordance with the standard protocol described in the Asbestos Hazard Emergency Response Act (AHERA) final rule ($) CFR 763, Appendix A to Subpart E).

Prepared TEM sample grids were analyzed following the EPA Level II provisional method. The asbestiform particulates (particles having at least a 3 to 1 length to width ration) were counted and identified at a screen magnification of 15,000 to 20,000X. Identification of asbestos was accomplished by using morphology, selected area diffraction (SAED) and energy dispersive x-ray analysis (EDXA). The mass of each asbestos fiber was calculated by multiplying the volume of the fiber (assumed to be a cylinder) by the density of asbestos (2.55 g/cu. cm. for chrysotile, 3.3 g/cu. cm. for amphiboles). The results were expressed in micrograms of asbestos per gram of soil and in weight percent. The analytical sensitivity of the method was based on one fiber 0.2 micrograms in length and 0.05 micrograms in width. The quantifiable limit of detection was based on 4 fibers 1.26 micrometers in length and 0.08 micrometers in width.

Asbestos structures detected were primarily chrysotile. Very few amphibole structures were detected.

The results for analyses for asbestos content of soil samples are summarized in Table I. All samples analyzed for buildings 2a and 4a showed concentrations of asbestos above quantifiable

detection limits. Note that detection limits may vary between samples, since this parameter is directly dependent on the dilution factors used to obtain adequate filter loadings suitable for TEM analysis. Two of the control samples showed asbestos concentrations above the detectable limit. Average asbestos concentration in the soil samples collected around building 2a were nearly 40 times greater than for those samples from building 4a. None of the samples contained asbestos in quantities greater than one percent by weight.

The observed high variability associated with the results within groups of samples is most likely attributable to the low asbestos concentration present in these samples. The quality control analyses performed on samples SO2-3, SO2-5 and SOC-3 reflected the same degree of variability. Regardless of this variability, it is reasonable to state that the asbestos concentration of soil samples collected in the vicinity of transite-clad buildings is considerably greater than that of control samples.

2.2.2. Gutter Sediment Samples - Table II

The buildings selected for this study were 2a, 5, 2d, and 12. While buildings 2a and 5 were selected as having asbestos roofs representative of the typical deteriorated condition found in most transite clad buildings, building 2d was selected as a worse case condition. The asbestos cladding in this building, which housed the nitric acid metal dissolver process, showed signs of extreme deterioration. Building 12, which is a cinder block addition to building 12a (a transite-clad building) and which has a flat built-up roof, was selected as a "control" building. Detection of asbestos fibers in the gutter sediments of this building would suggest migration of fibers from adjacent asbestos roofs.

Three gutter samples were collected from accessible locations at each of the four buildings selected. When possible, the three gutter samples were collected at evenly spaced locations along the length of the gutter. Gutters sampled were at least 25% full. Each sample was collected using a small gardening shovel in enough quantity to fill a 125 cu. cm. precleaned graduated glass bottle (VWR Cat. No. 16194-041).

Samples were processed, prepared for analysis and analyzed by TEM following the same procedure used for soil samples.

Chrysotile was the only type of asbestos detected in these samples. The structures detected were represented by individual fibrils, bundles, and a few clusters. The analytical results for the gutter samples collected are shown in Table II. Asbestos was detected in all samples in quantities above the quantifiable detection limit. Asbestos weight concentration ranged from 0.2 to about 10 percent.

2.2.3 Surface Dust Samples from Sidewalks/Pavements - Table III

Three microvacuum samples each were collected on the adjacent sidewalks and pavements of buildings 2d, 4a, and 20a as described above. Building 20a was selected as a case of a transite-clad building without gutters. A set of control samples were also taken at the Building 73 Fire Brigade Training Center. Prior to sampling, the pump and cassette assembly was calibrated to approximately 8 L/min. Sampling areas were located one foot from the wall and evenly spaced along or around the building sampled. The 100-cu. cm. area was vacuumed by lightly dragging the nozzle of the microvacuum across the marked sampling area. The area was vacuumed for about 30 seconds in one direction and another 30 seconds in a direction 90 degrees to the first. After vacuuming, the cassette assembly was turned upright so that the nozzle faced up before shutting off power to the pump. The nozzle was then removed and placed inside the cassette. Finally, the cassette was capped, labeled and stored upright in a clean sample box.

In general, dust samples were collected and analyzed following the EPA draft test method for sampling and analysis of dust for asbestos structures by transmission electron microscopy. The samples were collected by vacuuming a 10 cm. x 10 cm. area with a standard "closed face" 25-mm asbestos air sampling cassette loaded with a 0.45 micrometer MCE filter membrane, fitted with a one-inch long plastic tubing nozzle, and connected to a sampling pump with flexible tubing. This sampling technique has become known in the asbestos industry as the "microvacuum technique". The sample was then transferred from inside the cassette to an aqueous solution of known volume. Aliquots of the solution were then filtered through a 0.45 micrometer MCE filter membrane. A section of the filter was prepared following standard preparation methods and transferred to TEM grids for analysis. The asbestiform particulates were sized and counted by TEM at a screen magnification of 15,000 to 20,000X as specified in the Asbestos Hazard Emergency Response Act (AHERA) final rule (40 CFR 763, Appendix A to subpart E). The results were expressed as structures per square centimeter (s/sq. cm.) of measured surface area. The desired analytical sensitivity for the method was 200 s/sq. cm. Counting rules require stopping the analysis on the 21st grid opening or on the grid opening that contained the 100th structure, whichever occurred first.

As the results in Table III indicate, asbestos structures were detected in all of the samples, including those taken at the control building. Most of the structures observed were less than 5 micrometers in length. No asbestos forms other than chrysotile were detected in these samples.

2.2.4 Surface Dust Samples from Roofs - Table IV

To gain an understanding of the release factors of asbestos fibers from the corrugated transite roofs, three microvacuum samples each were collected at buildings 2d, 2a, 5, and 20a. These samples were collected about two feet in from the roof edge in the same manner described above.

Because of the high fiber loading obtained for these samples, the desired analytical sensitivity of 200 s/ cu. cm. could not be achieved. Thus, the recommended aliquot dilution factor of the aqueous solution had to be significantly decreased in order to obtain adequate particle loadings on the TEM grids.

2.2.5 Airborne Asbestos Concentration Before and During Street Sweeping Activity - Tables V and VI

One street sweeping activity was monitored. Five background air samples were collected in the afternoon of January 21, 1992. The streets were not swept on that day. Two days later, five air samples were collected while the streets were being swept. Air samples were collected using stationary high flow pumps calibrated at approximately 10 L/min. Sampling pumps were placed by curb side or on sidewalks in the route of the sweeper. Samples were collected at a height of approximately 36 inches above the pavement or sidewalk. Background samples were collected over a period of about three hours. Sampling time for the air samples collected during the street sweeping episode was about five hours.

Air samples were collected on standard 25-mm asbestos sampling cassettes loaded with 0.45 micrometer MCE filter membranes. Filters were prepared for TEM analysis in accordance with the standard protocol described in the Asbestos Hazard Emergency Response Act (AHERA) final rule (40 CFR 763, Appendix A to Subpart E). Prepared TEM sample grids were analyzed following the EPA level II provisional method and a PCM Equivalent analysis. In the latter method, an area equivalent to that used in the NIOSH 7400 method is analyzed and only asbestos fibers or bundles with an aspect ratio of 3:1, a width greater than 0.3 micrometers, and a length greater than 5 micrometers are used to estimate the average fiber concentration.

3.0 Potential Magnitude of Threat

3.1 Per the AHERA format described in Section 2.1, any ACM identified in the Asbestos Site Survey that was assessed in Hazard Rankings #4 through #7 required abatement (see Figure #2). The number of facilities in each category are as follows:

Hazard Rank	Description	No. of Homogeneous Areas
4	Damaged	136
5	Damaged, plus Potential for Damage	91
6	Damaged, plus Potential for Significant Damage	6
7	Significantly Damaged	75

The above homogeneous areas have been further graded for priority abatement, and abatement of these areas is being performed on a regular basis by a dedicated group of fully trained workers known as the "Asbestos Team". (Note: as of 8/5/92, 34 of the above homogeneous areas have been abated and asbestos work orders have been written for 52 others.)

The potential magnitude of threat is minimized by properly managing ACM in place. This is achieved by the above abatement efforts, periodic re-inspections of all facilities, and the procedures outlined in the Asbestos Operations and Maintenance Work Practices document.

The six areas of damaged transite mentioned in Section 2.1 have been evaluated in a study performed by Lockwood Greene Engineering. The results of this study have been turned over to Parsons, with instructions to develop appropriate response actions.

3.2 Due to its complexity, an exhaustive Transite Fiber Migration Study which would address the influence of all the parameters and variables which affect the release, deposition and migration of asbestos fibers due to the weathering of transite panels at the FEMP was not considered to be practical or economically feasible. The investigations undertaken with the pilot study have provided the necessary data to determine the existence of asbestos contamination in the different migration pathways identified.

However, because of the sampling restrictions and limited number of observations in each of the investigations of this pilot study, extensive statistical treatment of the data was not considered appropriate. For convenience, arithmetic means are provided for groups of samples representing similar sampling events.

3.2.1 Soil Samples

Surface soil adjacent to transite-clad buildings showed low levels of asbestos contamination above background. The analytical results indicate that the soils sampled contain asbestos in quantities estimated to be less than one percent by weight. Unfortunately, this observation cannot be generalized to all surface soils at the FEMP due to the sampling limitations imposed by the nature of the pilot study.

Simple comparison of the soil analysis results for Buildings 2a and 4a suggests, as reasonably expected, that a direct relationship exists between the degree of deterioration observed in a building and the concentration of asbestos in the soil.

3.2.2 Gutter Sediment Samples

The results of the analyses of the gutter sediment samples showed that the asbestos concentration in samples collected varied between 0.2 to 10 percent by weight. The results indicate a rough relationship between the degree of deterioration of the roof and concentration of asbestos in the gutter sediments.

3.2.3 Surface Dust Samples from Sidewalks/Pavements

Simple comparison of the results in Table III show that the asbestos structure density in sidewalks and pavements adjacent to transite-clad buildings is 100 to 1,000 times the structure density found at the control building. The high degree of flaking and delamination of the walls of Building 2d is probably related to the higher surface contamination observed in the adjacent sidewalks.

Compared to indoor guidelines, the concentration of asbestos in surface dust sampled from sidewalks and pavements are considerably elevated. According to some researchers, concentrations over 1,000 s/sq. cm. should be considered high. Concentrations over 100,000 s/ sq. cm. have been found when an abatement barrier has been breached. Although the vast majority of the asbestos structures detected in these samples were shorter than 5 microns, the potential for respirable emissions if surface dust is disturbed has to be considered great.

On the other hand, surface contamination around Building 4a, whose walls are in relatively good condition, was much lower. An intermediate condition is reflected by the results obtained for Building 20a, whose walls are not as deteriorated as those of Building 2d.

3.2.4 Surface Dust Samples from Roofs

Table IV summarizes the results of the analyses of the surface dust samples collected on transite roofs. These results clearly demonstrate the ease by which asbestos fibers are dislodged from the deteriorated surfaces of transite roof panels. Although critical visual inspections of the roof surfaces were not a part of the study, simple observations of roof surface conditions suggest that heavily deteriorated surfaces, such as those observed in Buildings 2d and 5, are associated with the release of higher amounts of asbestos fibers. These results are also in agreement with the asbestos concentration found in the gutter samples collected at these buildings.

The large amount of asbestos detected in the surface dust samples from roofs is indicative of the ease by which asbestos fibers can be released from the surface of deteriorated roofs. The data generated in the pilot study do not allow the determination of the quantity of asbestos that is generated by the action of rain, wind, and other phenomena. Estimates are that weathered and corroded transite roofs can release as much as 3 grams of asbestos per square meter per year. Using this emission factor, it can be estimated that the total amount of asbestos from the 26,400 square meters of transite roof surfaces at the FEMP could be as high as 174 pounds of asbestos per year. It is further estimated that about 80 percent of the asbestos is washed out by rain water and 20 percent is released to the ambient air, which may explain why the asbestos content is higher in gutter sediments than in the soils.

3.2.5 Airborne Asbestos Concentration Before and During Street Sweeping Activity

Tables V and VI show the results for the area air samples collected before and during the street sweeping activity. The asbestos structure concentrations obtained by these two methods are in agreement with typical ambient air samples in urban environments. These results suggest that the mechanical street sweeping is not likely to be a source of asbestos emissions which merits concern.

4.0 Assessment of Need for a Removal Action

Consistent with Section 40 CFR 300.410 of the National Contingency Plan, the Department of Energy (DOE) shall determine the appropriateness of a removal action. Eight factors to be considered in this determination are listed in 40 CFR 300.415 (b) (2). The following apply specifically to the above background concentration of asbestos occurring in the soil adjacent to buildings, gutters, dust at the FEMP site.

40 CFR 300. 415 (b) (2) (i)

Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants.

40 CFR 300. 415 (b) (2) (ii)

Actual or potential contamination of drinking water supplies or sensitive ecosystems.

40 CFR 300. 415 (b) (2) (iv)

High levels of hazardous substances or pollutants or contaminants in soil largely at or near the surface, that may migrate.

40 CFR 300. 415 (b) (2) v)

Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.

40 CFR 300. 415 (b) (2) (vii)

The availability of other appropriate federal or state response mechanisms to respond to the release.

40 CFR 300. 415 (b) (2) (viii)

Other situations or factors that may pose threats to public health or welfare or the environment.

5.0 Appropriateness of a Response

The driving force for the appropriateness of a response is 40 CFR 300.415 (b) (3), and 40 CFR 300.415 (b) (4) (i) and (ii).

If it is determined that a response action is appropriate due to both the level of contamination found in the soil adjacent to the buildings, gutters, curb surfaces, and dust at the FEMP Site and the potential of a contaminant migration, a removal action may be required to address the existing situation.

If a planning period of less than six month exists prior to initiation of a response action, DOE will issue an Action Memorandum. The Action Memorandum will describe the selected response and provide supporting documentation for the decision.

If it is determined that there is a planning period greater than six months before a response is initiated, DOE will issue an Engineering Evaluation/Cost Analysis (EE/CA) Approval Memorandum. This memorandum is to be used to document the threat of a public health and the environment and to evaluate viable alternatives response action. It will also serve as a decision document to be included in the Administrative Record.

Figure #1

Summary of ACM at the FEMP by Category

ACM CATEGORY	QUANTITY	UNIT
Acoustic Panels (2" x 4')	144	SF
Acoustic Tile Mastic	33,600	SF
Boiler Insulation	8,270	SF
Debris Samples	1	EA
Duct Insulation	7,620	SF
Fabric/Rope	32	LF
Fire Retardant Clothing	54	EA
Stored Firebrick	15	SF
Floor Tile Mastic	101,208	SF
Flue Insulation	4	LF
Gasketry	418	LF
Heat Shield	5	SF
HVAC Flexible Connector	44	EA
Insulation	100	SF
Joint Compound	33	SF
Other (Tar Insulation)	20	SF
Pipe Fitting Insulation	10,708	EA
Pipe Fitting Insulation Lagging	38	SF
Pipe Run Insulation	60,726	LF
Pipe Run Insulation Lagging	2,148	LF
Resilient Floor Tile (12" x 12")	3,232	SF
Resilient Floor Tile (9" x 9")	131,161	SF
Roof Flashing	290	SF
Smoke Stack Insulation	2,400	SF
Storage Tank/Exchanger Insulation	8,921	SF
Storage Tank/Exchanger Lagging	4,003	SF
Transite Pipe	111	LF
Transite Sheet Material	2,424,218	SF

SF = Square Foot

EA = Each

LF = Linear Foot

FIGURE #2

RESPONSE ACTIONS BASED ON HAZARD RANKING

Hazard Rank	Removal Priority	AHERA Categories	Response Actions Required by AHERA
7	1	Significantly Damaged	Evacuate or isolate the area if needed. Remove the ACBM (or enclose or encapsulate if sufficient to contain fibers). Repair of thermal system insulation is allowed if feasible and safe. O&M required for all friable ACBM.
6	2	Damaged + Potential for Significant Damage	Evacuate or isolate the area if needed. Remove, enclose, encapsulate, or repair to correct damage. Take steps to reduce potential for disturbance. O&M required for all friable ACBM.
5	3	Damaged + Potential for Damage	Remove, enclose, encapsulate, or repair to correct damage. O&M required for all friable ACBM.
4	4	Damaged	Same as hazard rank 5
3	5	Potential for Significant Damage	Evacuate or isolate the area if needed. Take steps to reduce potential for disturbance. O&M required for all friable ACBM.
2	6	Potential for Damage	O&M required for all friable ACBM.
1	7	No Problem	O&M required for all friable ACBM, but measures need not be as extensive as above.

Note: AHERA does not account for combinations of current and potential damage (i.e., hazard ranks #5 and 6). The response actions shown are combinations of those required for each condition.

Supporting Documentation

A. Study for Systematic Removal of Buildings and Facilities

Identifies buildings and facilities no longer needed and provides guidance for future demolitions and renovations. Due to the USEPA on 1/15/93.

B. Work Plan for Plant 7 Dismantling

Due to the USEPA on 4/20/93.

C. Safe Shutdown Work Plan

Submitted to the USEPA on 10/31/91 in fulfillment of Consent Agreement Removal Action #9; revised and resubmitted to the USEPA in June of 1992.

D. Asbestos Site Survey

Completed on 2/28/92. Available upon request.

E. OU3 RI/FS Work Plan Addendum

Submitted to USEPA on 5/29/92.

F. OU3 Remedial Investigation Report

Due to the USEPA on 6/11/96.

G. OU3 Feasibility Study Report

Due to the USEPA on 11/5/96.

H. Transite Fiber Stabilization Study

Due to be completed 10/92.

ATTACHMENT TO WEMCO:EM:92-214

FEMP ASBESTOS ABATEMENT PLANS

Background

An Asbestos Site Survey for the FEMP was completed in February of 1992. This Survey identified and assessed the condition of all ACM, and established the abatement procedures to be used on a priority basis. A "Facility Owner's Report" has been sent to each Facility Owner, which provides the above information as well as CAD diagrams showing the physical location of the asbestos-containing material (ACM).

Several years ago, it was noticed that a considerable amount of asbestos fibers had accumulated in the gutter debris of buildings that were clad with transite roof panels. For this reason, a Transite Fiber Migration Study was performed. This Study indicated that asbestos fibers are washing from the transite roofing panels into the storm water system, and that the soil and concrete samples adjacent to transite clad buildings show a high amount of asbestos fibers as compared with control samples.

Short Term Plans (< 5 years)

The short term plans involve the prompt abatement of ACM on the site that has been identified as having the potential for exposures to site workers involved in remedial investigations at the site. This asbestos material has been classified as a potential employee protection concern more than an environmental risk, and targeted for immediate removal or other abatement.

Specifically, the ACM identified during the Site Survey has been assessed per the protocol of the Asbestos Hazard Emergency Response Act, and categorized into Hazard Ranks of 1 through 7 (where 7 represents the most hazardous condition). **Any ACM in a 4, 5, 6, or 7 ranking shall be encapsulated, encased, repaired, or removed.** Asbestos Work Orders have been written for those jobs that can be scheduled by Maintenance, and these are currently being abated by the FEMP Asbestos Team. Any jobs that cannot be done by the Asbestos Team are abated per the "Large Scale Abatement" procedures, as described in the next section.

All facilities are inspected at least annually, to ensure that the condition of the ACM has not changed. If ACM has become damaged, or for whatever reason has been re-assessed into categories 4 through 7, the ACM shall be abated.

The above simply means that some ACM that is in poor condition will be removed soon, and an undetermined - but probably small amount of ACM will be removed in the near future as its condition degrades for whatever reason. All of this will be done within the current Asbestos Management Program, specifically per the Asbestos Operations & Maintenance Work Practices Manual (OM-0005) and Control of Work Involving Asbestos document.

Large Scale Abatements Involving Health & Safety Concerns

Upon completion of the Asbestos Site Survey, there were some critical areas of the site identified as health and/or safety concerns (hazard ranking of 7) which involved quantities of asbestos too large to be designated as small scale, short duration abatements. Most of these projects focus on deteriorating transite that pose an unacceptable safety risk, and for that reason have been targeted for immediate abatement as part of the ongoing Environmental Management Asbestos Program. In addition to the Site Survey, Asbestos Consultants have examined each of these areas to confirm the seriousness of the hazard and recommend the appropriate abatement action (encasement, encapsulation, removal, repair). These projects have been reviewed and prioritized, and abatement will be done in accordance with CERCLA RI/FS concerns.

Renovations

Some asbestos will be removed as a result of renovation projects that do not necessarily involve hazardous ACM such as the recent lab renovation. These removals shall be budgeted and managed as part of the overall facility renovation, with technical program oversight provided by Asbestos Program personnel. Any such work will be done by personnel that are certified to remove asbestos in the State of Ohio.

Long Term Plans (> 5 years)

The long terms plans for the asbestos abatement focus on the ACM which is not targeted as an immediate short term health and safety hazard, but poses environmental (and worker protection) hazards during facility demolitions, and environmental weathering (transite) that occur while the FEMP is remediated. As communicated to the USEPA in the Asbestos Abatement Removal Action #26 Compendium, the current long term plans reflect information from the Asbestos Site Survey, Transite Fiber Migration Study, and the Safe Shutdown Work Plan (Removal Action #12). These long term plans will continue to evolve as other supporting documentation*, in particular the "Study for Systematic Removal of Buildings and Facilities" (due to USEPA 1/15/93) is compiled. For now, the plans generally describe how the FEMP shall address abatements involving demolitions and deteriorating transite. All major abatements will be addressed by OU3 Removal Actions.

Safe Shutdown

It is anticipated that very little abatement of ACM will occur as a part of the Safe Shutdown Program. Any abatement required will be addressed per the Work procedures within the Safe Shutdown Program (Removal Action #12 Work Plan), with technical program oversight provided by personnel from the Asbestos Management Program.

Demolitions

As facilities are scheduled for demolition, any ACM removal will be addressed as part of the Removal Action Work Plan (e.g. Plant 7 Dismantling).

The actual plan for demolition of onsite facilities will be published as a part of the "Study for Systematic Removal of Buildings and Facilities", which is due to the EPA on 1/15/93. When this Study is issued, the ACM removal for each facility can be prioritized using the information from the Asbestos Site Survey.

Transite

The Asbestos Site Survey identified only five large scale abatement projects that required immediate abatement due to deteriorating transite, but many more of the 56 buildings were observed to contain transite in various degrees of decomposition.

Based on these Survey results, the Transite Fiber Migration Study, and the inevitable weathering of untreated FEMP transite, a Transite Fiber Stabilization Study is now in progress to determine the best, general method for stabilizing deteriorating transite. The recommendations of this Study (due in October of 1992) will:

1. Present alternatives as to how to treat the transite surfaces.

2. Be tied to the Building Removal Study mentioned above, in that the treatment of transite surfaces may differ depending on whether the building will be demolished in two years, twenty years, or may remain indefinitely. This Study and the Building Removal Study will be used to prepare the details of transite abatement, which will be submitted within one month of the completion of the Building Removal Study.

3. Conform with the implementation of OU3 Response Actions.

Summary

Some key points that should be highlighted:

* ACM at the FEMP has been identified, assessed, and prioritized for abatement.

* An active program is in place to abate the most serious problems in the short term, and provide technical program oversight in the long term remediation involving non-critical ACM.

* All facilities are re-inspected annually to ensure current plans reflect the most accurate assessment of ACM hazards.

* The "Study for Systematic Removal of Buildings and Facilities" and the OU3 RI/FS will determine the (demolition) ACM removal priorities.

* The Transite Fiber Migration Stabilization Study will determine the manner in which transite panels are treated.

ATTACHMENT IV

FEMP Asbestos Abatement Plans
(To be inserted in Section III, Step 8 of the RA #26 Compendium)

TABLE I. Results of the Asbestos Analysis of Soil Samples

	Sample ID	µg/g	% Asbestos	Detection Limit µg/g
Bldg. No. 2a	SO2-1	1761.3	0.18	8.96
	SO2-2	838.9	0.08	8.96
	SO2-3	8299.2	0.83	8.96
	SO2-4	2131.1	0.21	8.96
	SO2-5	740.7	0.07	11.23
	SO2-6	1637.8	0.16	8.96
	Arithmetic Mean	2568.2	0.26	----
Bldg No. 4a	SO4-1	22.1	<0.01	9.49
	SO4-2	108.8	0.01	9.49
	SO4-3	56.2	<0.01	9.49
	SO4-4	68.4	<0.01	9.49
	SO4-5	41.1	<0.01	9.49
	SO4-6	114.9	0.01	9.49
	Arithmetic Mean	68.6	<0.01	----
Bldg No. 20	SO20-1	388.4	0.04	9.40
	SO20-2	193.4	0.02	9.40
	SO20-3	175.8	0.02	9.40
	SO20-4	62.4	<0.01	9.40
	SO20-5	103.0	0.01	9.40
	SO20-6	113.1	0.01	9.20
	Arithmetic Mean	172.7	0.02	----
Control	SOC-1	<8.8	<<0.01	8.8
	SOC-2	<8.8	<<0.01	8.8
	SOC-3	<8.8	<0.01	8.8
	SOC-4	<8.8	<<0.01	8.8
	SOC-5	65.9	<0.01	8.8
	SOC-6	22.7	<0.01	8.8
	Arithmetic Mean	20.6	<0.01	----

TABLE II. Results of the Asbestos Analyses of Gutter Sediment Samples

	Sample ID	µg/g	% Asbestos	Limit Of Detection µg/g
Bldg No. 2d	G2-1	6092.5	0.61	45.61
	G2-2	3931.1	0.39	45.61
	G2-3	2061.7	0.20	96.29
	Arithmetic Mean	4028.4	0.40	—
Bldg No. 2a	G2/3-1	10967.2	1.10	79.76
	G2/3-2	8342.3	0.83	79.76
	G2/3-3	5308.8	0.53	79.76
	Arithmetic Mean	8206.1	0.82	—
Bldg No. 5	G5-2	24607.0	2.46	256.84
	G5-3	101073.9	10.10	744.85
	G5-4	24785.7	2.48	392.03
	Arithmetic Mean	50155.5	5.02	—
Bldg No. 12	G12-1	23164.5	2.32	180.69
	G12-2	6905.4	0.69	109.17
	G12-3	6226.5	0.62	180.69
	Arithmetic Mean	12098.8	1.21	—

TABLE III. Results of the Asbestos Analyses of Surface Dust Samples from Sidewalks/Pavements

	Sample ID	s/cm^2
Bldg No. 2d	SU2-1	1,554,471
	SU2-2	3,204,393
	SU2-3	3,012,129
	Arithmetic Mean	**2,245,714**
Bldg No. 4a	SU4-1	742,692
	SU4-2	246,240
	SU4-3	129,802
	Arithmetic Mean	**372,911**
Bldg 20a	SU20-1	1,610,029
	SU20-2	525,520
	SU20-3	443,579
	Arithmetic Mean	**859,709**
Control	SUC-1	309
	SUC-2	2,472
	SUC-3	5,563
	Arithmetic Mean	**2,781**

TABLE IV. Results of the Asbestos Analyses of Surface Dust Samples from Roofs

	Sample ID	s/cm^2
Bldg No. 2d	MV2-1	2.3×10^9
	MV2-2	0.7×10^9
	MV2-3	0.8×10^9
	Arithmetic Mean	1.3×10^9
Bldg No. 2a	MV2/3-1	0.4×10^9
	MV2/3-2	0.2×10^9
	MV2/3-3	1.1×10^9
	Arithmetic Mean	0.6×10^9
Bldg No. 5	MV5-11	1.1×10^9
	MV5-22	1.1×10^9
	MV5-33	2.7×10^9
	Arithmetic Mean	1.6×10^9
Bldg No. 20a	MV20-1	0.18×10^9
	MV20-2	0.02×10^9
	MV20-3	0.18×10^9
	Arithmetic Mean	0.13×10^9

TABLE V. Airborne Asbestos Concentration (S/cm^3) Before and During Street Sweeping Activity

Location	Asbestos Concentration (s/cm^3) Before	During
Building 11 - Laundry Loading Deck	<0.002	<0.001
Quardrex Office - North End	<0.002	<0.001
Building 6 - North End	<0.002	<0.001
Building 20 - North End	<0.002	<0.002
Building 46 - Northeast End	<0.002	<0.001

TABLE VI. PCM Equivalent Airborne Asbestos Concentration (s/cm^3 > 5μm long) Before and During the Street Sweeping Activity

Location	Asbestos Concentration (s/cm^3, > 5μm long) Before	During
Building 11 - Laundry Loading Deck	<0.0003	0.0002
Quardrex Office - North End	<0.0003	<0.0002
Building 6 - North End	<0.0003	0.0002
Building 20 - North End	<0.0003	<0.0002
Building 46 - Northeast End	0.0002	<0.0002